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THE INDIVIDUAL

THE INDIVIDUAL

A Study of Life and Death

By

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New York
D. Appleton and Company
1901

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PREFACE

Modern science has done much to change the conceptions of men as to their place in the universe. The ancient view that the earth and all its living tenants were suddenly created is passing away, and in its stead there is coming, in a swift and inevitable way, the conviction that all we see or know is but a part of a vast orderly procession of which we can discern neither the beginning nor the end.

It needs but a slight acquaintance with the history of man to make it clear that the best part of his nature, his moral and social qualities, has to a considerable extent been founded on his beliefs concerning his origin and the ways in which he has been controlled by the powers above him. It is evidently a most important question as to how far this change of view is likely to alter human conduct. Is it likely to overthrow or even to shake the institutions of morality, or will it serve to make them firmer than before?

It is evidently too soon to determine in any observational way what the answer to this question is to be; for, while almost all educated men have some knowledge of the new learning concerning man's place in Nature, very few so possess it and are possessed by it that their states of mind afford any index as to what the result will be when it is fully shared by all and is the actual basis of thought and action. We can, however, obtain some idea as to the effect which this knowledge is likely to have upon the generations to come by examining into such of the revelations of science as directly relate to the place of man, to see whether they are likely to lessen his sense of duty to himself or his fellows. It is one of the objects of this book to make such an inquiry. The main purpose, however, is to present to the reader a sufficient account of what his individual life means in the great order.

The meaning of our several individual lives in relation to those of our fellow-beings and of the great realm is the most important of all quests. To attain to some understanding, however limited, of these matters, it is necessary first of all to obtain a sufficient idea of the steps by which it has come about that we are here as individuals with a measure of personal independence, serving our fellow-men and questioning the universe concerning our origin and destiny. Above all, we need to seek knowledge as to the reason for the brevity of life which, seen nakedly, makes existence seem but a mockery.

Because the problem of death is beyond all others momentous, it has the largest share of consideration in the following pages. As will be seen, the effort is to show that the brevity of life in the organic individual necessarily arises from the educable quality of all the individualities of that group; that in proportion to the advance in station of any group of animals and plants the duration of its members has to be more and more accurately fixed, until in man and other of the higher forms the term is as firmly established as are the features of the body. It is in the considerations relating to the nature and history of individuality that we may hope to find whatever of moral help that natural science can give us. The facts when clearly seen certainly lead us to a better understanding of what death means in the great order.

As the purpose of this book is to set forth a naturalist's judgment of life and death, no deliberate consideration is given to matters of religion; so, too, many interesting questions of a purely philosophical kind as to the nature of individuality have not been touched upon. This metaphysical aspect of the problem has been amply discussed in Dr. Josiah

Royce's work on the subject. It should thus be evident that while the following pages are devoted to what seems to the writer a very important branch of the inquiry, that which concerns the tangible facts and the conclusions to be drawn therefrom, there is much else to be taken into account.

It is evident that the modern views as to the nature and origin of life are in ever-increasing measure to direct the attention of men to what their presence in this world means. It is also clear that the naturalist's contribution, even though the value of it be questioned, has the right to be heard first in the debate. All explanations must take account of the facts with which he deals and the conclusions to which he is led.

N. S. S.

Cambridge, *July*, *1900.*

INTRODUCTION

The matter of death has been the subject of endless consideration. From the time men began to think at all, the question of their passing has been uppermost in their thought. The certainty of it has affected every life; has shaped our societies and religions; indeed has made life what it is. So far, however, this matter of death has received little deliberate attention. The phenomena connected with it have been well described. The problems of natural selection and of evolution have called attention to the results which come from the temporary quality of the individual, but they have not led to any extended interest in the relation of the ephemeral nature of the individual to the other individualities of the universe and to the method of its organization.

In the following chapters I propose to approach the question of death from the point of view of its natural history, noting, in the first place, how the higher organic individuals are related to those of the lower inorganic realm of the universe. Then, taking up the organic series, I shall trace the progressive steps in the perfection of death by a determination as to the length of the individual life and its division into its several stages from the time when the individual is separated from the general body of the ancestral life to that when it returns to the common store of the earth. Upon the basis of the knowledge we may thus obtain, I shall endeavour to see what qualifications of the accepted view of the great accident we may make—how, in a word, we may hope to work toward a reconciliation of our death with the order in which we find ourselves placed.

For obvious reasons the subject will not be treated in what is commonly termed the religious way—in the manner that goes behind the facts, or, perhaps we should say, above them; but in the matter-of-fact way—that which looks alone to the phenomenal for the explanation sought. The reader should understand that this limitation is by no means to be considered as a denial of the importance of the other method of approach, but that it is taken in order to avoid the mixture of religious and scientific methods which have been so generally profitless. No man should endeavour to journey on two paths at the same time, or on the same way in two vehicles. Should he do so he is sure to fail of his end.

In the chapter on the effect of religion on the attitude of men toward death, it should be understood that the statements which are there made are directed not against faith in the higher sense, not in the least against Christianity in its native form, but against the curious remnants of primitive religions which have crept into this most magnanimous of beliefs, turning its blessings into curses and its light into darkness, thereby laying a burden upon human life and hope in ways even more grievous than those of pagan times.

In effect this book is a plea for an education as regards the place of the individual life in the whole of Nature which shall be consistent with what we know of the universe. It is a plea for an understanding of the relations of the person with the realm which is, in the fullest sense, his own; with his fellow-beings of all degrees which are his kinsmen; with the past and the future of which he is an integral part. It is a protest against the idea, bred of many natural misconceptions, that a human being is something apart from its fellows: that it is born into the world and dies out of it into the loneliness of a supernatural realm. It is this sense of isolation which, more than all else, is the curse of life and the sting of death.

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THE INDIVIDUAL

CHAPTER I

THE PLACE OF THE INDIVIDUAL IN THE UNIVERSE

It is an essential feature of man that he is an individual—a being separated from other units in a certain spacious way. We shall hereafter turn again to the question as to what this individuality means in the moral sense, and how it comes to be established by physical processes. Our purpose now is to see how far, if at all, this quality is peculiar to man, to his kindred, the sentient things or to the material realm. It is manifestly important to do this, for in that way alone can we take the first step toward measuring the value of this apparently peculiar isolation of the human being. To do this work we need to look abroad to see what we may as to the individualizing process in the several provinces of Nature.

In beholding the universe man finds himself hindered by the fact that he looks upon it along what may be termed a certain plane of sight which, while it opens to him much of the higher, denies him any vision of its lower units; he sees practically unlimited suns, but he can not see their elements; he knows nothing that is perfectly sure of the ultimate constitution of matter, and by inference alone is enabled to divine some of its fundamental qualities. The leading fact which he may ascertain is that all things commonly termed material probably consist of atoms, indivisible, all with eminent individuality acting and reacting upon one another, each after the manner of its kind. It is commonly held that each of these atoms is a permanent unit, one that is not divided by any of the powers which are applied to it, nor is it subject to any abiding changes. This evidence of the permanence of atoms rests upon a very limited body of experience. It has no other foundation than the tests of our laboratories and the evidence which the spectroscope affords, that in our sun and other like bodies in the visible universe the elements are arranged into the same groups as in our earth. As to the essence of an atom we know only the properties of each species in relation to those of others, and that each is the centre of actions which may extend very far beyond itself. Every one of the millions contained in the smallest object visible in the microscope is ever acting on the farthest body in the universe. We know, also, that each is the centre from which various sorts of control proceed by means of vibrations, passing now to the atom and again forth from it. There are also processes of control which can not as yet be clearly conceived as due to energy, as, for instance, those which give rise to the native qualities of these units.

As for the ultimate constitution of the atom, whether it be essentially simple or complex, we have no knowledge whatsoever. Granting that it is indivisible, it may still be of the order of indivisibility of a solar system: it may be made up of a complex of smaller bodies which owe their endurance to the most effective means of securing permanence in Nature, that which is won by ordered motions. So far as we can see there is no reason to suppose that the indivisibly small is attained when we come to the atomic stage of matter. There may, indeed, be system within system of individualities in indefinite extension into the infinite of the minute, quite as well as into the infinite of the great. The popular supposition of the atom as an ultimate in structure is hardly warranted by the facts we know about it; it is opposed to all we know of the constitution of the universe, of which it is a part. These statements are very speculative, but they have their use, for the reason that the notion of the atom as an essentially indivisible and simple thing sets a limit to the infinite on one side of the universe which serves to harm the true conception of its depths. Men cleave to these limitations: they afford seeming bounds to the natural, so that beyond them they may set the supernatural realm. Of old, they found a beginning and an end of the natural order. They imagined limits to space beyond which the lower control did not extend. Science has broken down these barriers to space, time, and law; but it has of itself instituted this new wall of the atom.

All we really know about the atom is that in descending in the order of magnitude of the individualities of the universe we finally come upon a very permanent kind of person, beyond whose barriers we have, as yet, found no means of breaking. The units of this estate have, like those of other estates, their qualities, perhaps their unchangeable characteristics. They differ from those of a higher order of complication, so far as we can see, only in the fact that they are unaffected by any influences we can bring to bear tending to break them into yet smaller units.

Next in order of complication come the individualities which are composed of two or more of these atoms, grouped in some order which may be that of motion or that of rest. These are the so-called molecules which are likewise quite beyond the limits of vision. When this molecular grouping of atoms occurs it is usually of those that belong to different species, with the result that a new individuality is created—one that, so far as we can see, has not the mere sum of the qualities of the elements, but is a third something which has been created from the union of the diversities.

The individualities of the molecule are so like those of the atom as to suggest that they are but a higher combination of the same order as that which makes the atomic units. This view has some support in the fact that, while the greater number of the molecular individualities are only broken up by heat or other agents of change, there are certain of them which are very firm as regards the bond, yielding only to the utmost skill the chemist can apply to bring about a parting of their lower units. When thus separated they seek quickly to fly back to their united state. The fewer the atoms in the system of the molecule, in general, the more limited the properties of the aggregate and the more stable their union. As the number of atomic individualities in the society increases, the greater the delicacy of its adjustment, until, in the more complicated of them, as we approach the protoplasmic aggregate, the number of units is to be reckoned by the thousand, and the construction is so delicate that it is easily destroyed. At this plane we pass from the inorganic to the organic, from the purely physical realm to that which is affected with another set of motives. Although we are concerned mainly with this higher stage of life, we must here turn aside to consider some other features in the history of the purely physical individualities.

The next kind of unit above the molecular which we have as yet discerned are the crystals—those combinations of atoms, individually or in secondary associations, which take on definite mathematical forms, or rather approach such forms without attaining perfection in them. These are so general in their occurrence that while we have not seen the crystalline shapes proper to many atomic species, or the most of their possible combinations, and many of them may never have existed, it is probable that every atomic or molecular aggregate has its normal crystal form—the order in which the units group themselves in the state of apparent rest which we associate with solidity. As to what may be the real condition of atoms or molecules in the crystalline repose, we as yet know nothing definite. The units may be in some kind of constant motion or at rest.

From what we know of the conditions of crystallization, we conclude that if all the matter of the universe were made free to run its natural course from the original diffused state to that of a complete solid aggregation, each kind by itself, it would enter finally, as it lost heat, upon the stable condition of the crystal form, which, so far as we can see, is the most fixed of any state. We have to conceive constant activity of the atom and the molecule, but this orderly grouping of the units in the crystal suggests an enduring repose.

As regards the degree of difference which may exist between atoms or molecules of the same species we know nothing that is certain. There are, however, some facts which have led chemists reasonably to conjecture that molecules at least exhibit a measure of individual peculiarity. When the student of the individualizing processes becomes well acquainted with the conditions which make for the development of personal qualities in all the visible units of the universe, he will be disposed to question the idea that these of the lower order differ from one another in no other feature save that of position. To hold to this view is, in a way, to deny that these persons of the lower estate are effectively in the realm we know —a realm where each individual is the product of innumerable reciprocal, infinitely varied influences acting from without and from within, which, save by a chance, expressed by the term "infinity to one," could not give rise to absolutely identical forms. Even if we take this view, we are held by the facts to the supposition that while the array of actions which make for variety take effect on these lower persons, their action is not commonly sufficient to disturb the balance of dominant forces which give what we term the static condition. In a word, we may conceive these lower creatures of the inorganic to be like the higher individuals of the organic realm, sensitive to external influences, yet so held by the dominating forces which shape them that they are limited in the variations they exhibit.

When in the ascending order of complexity we attain to the crystals we find at once that the personal quality of the individual is distinctly determined. It is a well-known fact that specimens from particular localities have, in many instances, characteristics which are quite easily recognised. Those who closely observe these forms are able to note differences which serve to distinguish members of the same species even when they appear at first sight to be quite alike. Moreover, recent inquiries into the minute features of crystals have shown that, for all their seeming simplicity, they are really very complicated structures. Thus in many, if not all, of their species the process of etching brings out on the cleavage planes curious microscopic pits the forms of which are in general characteristic of the species, while the details of their arrangement appear to be in a measure peculiar to the individual. However it may be with the invisible atoms and molecules, it seems clear that the lowest individualities of the inorganic realm which we can see differ one from another in the manner, if not in the measure, that we are accustomed to note in organic personalities.

Along with the chemical affinities and the related activities which are supposed to arise from the aggregations of matter, there acts another shape-giving influence, that of *gravitation*, which has much to do with the history of all the larger individualities of the universe. It, in fact, to a great extent controls their forms, from suns to men. As yet we know nothing concerning this mode of energy, if such we may term it, save that it appears to be proportional to the number of atoms there may be in any aggregate, and inversely proportional to the distance of one atom or mass from another. As all we know of atomic activity leads us to suppose that the qualities of these units depend on vibrations which are communicated to other atoms or to the molecular aggregates, it is very puzzling to be compelled to face another mode of action of these bodies, which behaves substantially like light, in that it can act at a distance, but is supposed to operate in some essentially different way from all other activities. I therefore venture to call attention to certain experiments by the physicist Bjerknes, which appear to indicate a possible solution of the mystery of gravitation. These are, in effect, that bodies of visible size when vibrating at the same musical pitch may attract one another. This seems to mean that a certain kind of waves may exist and be propagated through ether with the result that the bodies, thus moving at the same rate, are mutually attracted. It would be interesting to speculate on the ways in which this attraction through the instrumentality of synchronous waves could be effected. We are here concerned only with the fact that the experiments show such a mode of attraction to be possible. It is only necessary for us to suppose that every atom has, among its many modes of vibration, one absolutely general pulsation which exercises over all other bodies the effect given by likeness of musical pitch. We may indeed conceive that the gravitation impulse is due to the sum of the identical waves which exist among the vibrating units. If this view should be approved, or indeed any other which would find our conception of gravitation in the vibration of atoms, we should be rid of the worse stumbling-block in our endeavour to found our theory of the universe on the supposition that it is throughout an expression of energy. The importance of this point in our problem will become evident in the sequel.

Returning to the observable work of gravitation, let us note the effect it has in shaping the larger individualities of Nature. First, let us attend to its effects on the original distribution of matter, a point which brings us at once in face of the natural history of the stellar realm. As is well known, the belief of most astronomers is that the matter contained in the visible universe was once in a state of diffusion throughout and beyond all the realm of the fixed stars—the distant suns. In the process of the ages, this matter falling together to the several centres of its consolidation, impelled thereto by gravity, has generated the hundred million or more of aggregates, the solar systems of which our own sun and its attendants is a relatively insignificant specimen. The precise manner in which this work has been accomplished is by no means so clear as it was at one time supposed to be, for the inquiries of Professor George Darwin and Mr. S. J. See have shown that the tidal phenomena of the spheres, the tides in the primitive, molten masses, as well as those in the ordinary seas, tend to drive the spheres apart. It may thus be that while gravitation works to consolidate matter in such bodies as suns, planets, and satellites, it then proceeds by a critical change in its action to send these spheres away from one another. This change in the results of the gravitation action is interesting, as it is one of many, very many, instances in which we find the apparently uniform processes of Nature, those which are indeed uniform in their steps of action, leading to sudden and complete changes of result.

The important fact that is learned from the study of gravitation work is that it creates in the universe vast and complex individualities, the suns and their attendant minor bodies, each of which has its life history, its mode of birth, its processes leading to maturity, its period of rest after the forces which give rise to its activities have ceased to act. These individual bodies have each their own characteristics. They in a sense live their own lives, each different from the other; yet they do this by an endless interchange of actions, so that all that goes on in any one of them is affected by what takes place in every other. At first sight nothing seems more absolutely alone than an orb in space, parted by scores of millions of miles from its neighbours; yet it is a part of a system where each unit affects the other at every turn of its affairs. Every pulse of our hearts is due to the energy sent to the earth from the sun. The shapes of our lands are in large part determined by the ceaseless call that the moon makes on the seas. Though the isolation of any one solar system from another is more complete than that which exists in a planet of any one system, the same bond of interchanged action exists among them all. The spaces which part planet from planet, or from the sun, seem insignificant, and the connection between them appears almost intimate when we come to consider the abysmal spaces that separate even the nearest suns one from the other. Still, even through these voids each draws the other to itself. The way in which each goes onward into the unknown upon the path the systems pursue is determined by every other.

The history of the celestial systems shows us that the largest individualities we can discern in the visible realm come forth from the ancient and simple estate; that they have each won their personal isolation as have the lesser units of which they are composed. Yet each is absolutely bound up with the whole, is instituted in that whole without in any way parting from it. The apparent isolation is due in part to our complete ignorance as to what unites or wraps about the units or aggregates of matter. We know of this ether, or infinite space filler of the visible universe, little more than that it seems to be in a way material, as it in certain ways transmits impulses, and in a way not material in any sense of matter known to us, in that it in no measurable way resists the movement of the celestial bodies. It remains absolutely enigmatical when judged by any of the standards we apply to those parts of the universe which have the properties of matter. It has to be placed in a realm by itself into which we have as yet found no effective means of penetrating by experiment, and which is almost barred to the imagination.

We can not with satisfaction discuss the consideration of the ether as most physicists do, with mere negations, or with such suggestions as that it is "an absolutely elastic solid." We have to recognise that it is not pure space, but something actual—as actual indeed as any material thing, in that it has properties; as, for instance, the capacity of transmitting impulses, and presumably many others which we fail to perceive. From the point of view of our present inquiry, the characteristic feature of the ether is that it appears to be undifferentiated. It may possibly be the part of the cosmos which has not entered on the way toward individualization, which begins perhaps with the atom and proceeds to the great variety of units of the physical and the organic world.

Speculating as to its nature in the light of what we know of the processes of the universe, we may ask whether ether be not a mode of existence less complicated than that of the atom, one from which, by the organization of its units, the atom may have been evolved, as the spheres, from the pre-existing vapour? This, be it said, is mere speculation. The main point for us is that, in this ocean of the ethereal realm, which apparently remains as unindividualized as the infinite itself, has developed all the finite individualities, from atoms and suns to men.

Our brief summary of the physical world has shown us, in mere outline, but sufficiently for our limited purpose, how the progress of organization in that realm is not alone from the undifferentiated to the differentiated—though that, too, is discernible—but essentially to individualities, and from the simpler of them to the more complex; and, further, that each of these individualities, from atom or celestial sphere, is none the less of the whole because it is of itself; it acts ever in its surroundings and receives action therefrom to the uttermost ends of the discernible universe. It is hardly too much to say that on this individualizing process depends all the real work that is done within the universe. It is the reaction of one group of motives and capacities thus localized in the persons of the material world upon another, which is the basis of the universal life. It is only as these personalities arise that energy can find other than a mere potential existence. As they become more and more varied in their quality, the reactions attain a higher interactive form.

CHAPTER II

ORGANIC INDIVIDUALS

The glance at the conditions of inorganic individuals which is afforded by the preceding chapter may suffice to show that, in the apparently undifferentiated realm of the ether, there is a general process of constructing masses of varied order, atoms, molecules, crystals, and spheres, each endowed with its individuality, each related by interactions of diverse value to the whole realm. We readily see that all these isolated units, except, perhaps, the atoms, have their process of development and a subsequent history, ending with some kind of extinction, which arises, not from any internal requirement, but from changes in the external relations of the structure—molecules are broken up, crystals pass into solution, the activity of the spheres ends with the loss of heat which inspired their life; there is everywhere that endless flux which the thoughtful of all times have seen to be the most evident feature in the universe.

When we pass upward in the order of complexity from the so-called inorganic world to the organic, we at once perceive that we have passed a bound of much importance, though it is by no means easy to say where the limit lies or in what it consists. The ancients satisfied themselves with the simple concept that all matter was endowed with the spirit of life; that it was continually striving toward the state of animals or plants, though only a small part of it could ever attain to that station. They very generally regarded the fossilized remains which resembled living forms, not as the moulds of creatures that had lived, but as abortive attempts of dead matter to take on the shapes of the living. With the first steps in the development of biologic science it came to be recognised that all the higher species of animals and plants came from eggs or seeds; and with the advance in that learning, it was in time seen that any coming of the living form from other than like preceding life certainly takes place but rarely, and in exceptional, if not unique, conditions. In all the skilful and patient research which has been devoted to the task of proving the possibility of spontaneous generation, there has as yet been no instance found in which, from matter which was not already living, any organic being has been brought forth. The value of the evidence as to the separation of the living from the not-living, which became evident a century ago, has been increased by recent studies, with the result that naturalists have of late regarded the barrier between the two states as one of great permanence—one seldom passed, and then only under very peculiar conditions, the nature of which is not yet discovered.*

Although the difference between the inorganic and the organic is made tolerably plain by the fact that the living beings appear, in all the observed instances, to be derived from the antecedent organic forms, it is still very difficult to see in what this difference consists. For awhile some appeasement of curiosity in this matter was found by supposing that there was a vital principle which animated the individuals of the higher realm that did not operate in the lower; but this explanation is merely verbal; it has no true explanatory value, for it has no real meaning. In one form and another definitions have been presented, each having temporary acceptance, but in the end failing for lack of proof or because it was positively disproved. As the definition of the difference between the individuals of the lower and the higher estate, between those of the atomic, molecular, crystalline, or spherical realms and that to which we ourselves belong, is of much importance to our inquiry, it is well to note some of these efforts, and in the end to essay one of our own.

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* In the present state of our knowledge or, as we had better say, ignorance of the conditions in which the passage from the inorganic to the organic was effected, any apparently reasonable conjecture is warranted. I therefore venture the following suggestions: It is evident that the primal organism must have been formed in water, for there alone could such an association of materials as compose a single organic body have occurred or been perpetuated. It is very difficult to conceive how, in a primitive, lifeless sea or in lakes and rivers destitute of such organic matter, any water could have been found containing mineral matter in a sufficiently concentrated state to admit of the chemical processes necessary to the beginning of an organic structure. The only position where we can well conceive such a state of affairs to exist is in the cooling waters of a hot spring coming perhaps from lavas, or in a brook formed therefrom, where the fluid might be saturated with the substances derived from the rocks which, owing to the cooling, would tend to be deposited. This hypothesis, be it understood, by no means explains the way in which these dissolved materials took on their organic form; it only provides for the gathering together of the elements necessary for the organization; in a word, it helps us only a little way toward the critical point where the essentially lifeless becomes truly alive.

The old hypothesis of a vital principle, itself a modification of the ancient idea of a "plastic virtue" or a "fatty matter" in the earth that tended to breed life, gave way to the idea that there were certain natural forces which operated to create life and to keep the beings in their estate. So, for a time on, we find such definitions as that of the celebrated anatomist Bichât, to the effect in varied phrase that life is the congeries of all those forces which resist death. In the advance of the criticisms of explanations which demarks modern science from ancient learning, with the introduction of the mathematical spirit which has given so much to natural inquiry, all these mere verbal explanations have been neglected, and naturalists have turned to seek in the processes of organic species for a firmer ground on which to rest their definitions. It was suggested that the phenomena of reproduction were peculiar to the living forms, but it was soon found that in some unknown way the molecule and the crystal alike tend to increase their kind. Moreover, in its simplest form reproduction appears to be no more than the spontaneous division of the parent body, which may or may not take place. It was then suggested that the capacity of the living creature to feed—i. e., to take in previously existing molecular compounds which are broken up and are rebuilt into the body—was a sound basis for a discrimination; but this, too, failed, for the reason that a similar action was noted in crystals, and may exist even in the molecular aggregates. There can be no question that all the processes of reproduction and nutrition are very much more extensively turned to account in the organic than in the inorganic world, and that this difference in degree is a matter of the greatest importance. It is clear, however, that on them alone we can not well found our definition of the distinction between the two realms. It is indeed to be sought further and in something more fundamental.

In noting the individualities of the lower, purely physical realm, we remarked the fact that the associations of the atoms, the molecules, the crystals, and the sphere are each after the manner of its kind, essentially invariable except so far as they may be affected by forces from without. We have now to observe that this fixity appears to be absolute; the atoms in the stars are, as their light shows, the same in character as those found on the earth. The materials of the meteorites which come we know not whence, but certainly from other spheres than our own, show us the same minerals in the same forms as those belonging in the earth. The crystals of the oldest rocks in no important regards differ from those of to-day. In other words, these lower individuals, though they receive, transmit, and change the forms of energy, do their work always in substantially the same way. They in nowise obtain anything in their intercourse with their surroundings which goes to qualify the successors of their species. It is quite otherwise with the organic form; while, like its lower kinsmen, it receives, converts, and sends on energy, it is internally so affected by its surroundings that it undergoes changes, and, what is more important, these changes lead to the development of a measure of individuality in the units in a manner unknown to the lower realm. But the eminently important feature is that by some way or ways these changes are accumulated in the succession of the generations so that the species are in process of continual alteration. They are, as we observe, educated by their environment.

I have spoken of this difference between the ineducable lower realm of individuals and the higher organic educable forms as infinite. The word is not of too wide meaning to denote the utter change in the conditions of existence which the capacity to profit by the influences of environment brings about. The mechanical structures of the lower realm act in a uniform manner. Given a certain influence from without and the reaction is always the same wherever and at whatever time it occurs. In these higher individualities which we term "living" the structure has a personal quality which causes it to vary its action indefinitely; to change its form; to try endless adaptations to its conditions, and to alter its shape from generation to generation so as to secure the best possible adjustment to the surroundings. We thus see that it is the capacity of organic form to gather and store experience which demarks it from the inorganic. It should need no argument to show that this peculiarity puts the structure in an absolutely different order from that in which the lower forms lie.

The educable quality of the lowest organic individuality opens before it a kind of opportunity unknown in the simple states of aggregated matter; the atom, the molecule, the crystal, and the sphere can not go beyond the state set for them by their primal structure: the organic form can infinitely advance. But to make this advance certain conditions of existence which did not occur in the lower stages of being have to be instituted; to these changes we will now turn our attention. First, let us note that organic advance depends upon a process of trial between competitors for the chance to live. The field for the development of this life must in all cases be confined to the surface of some planetary sphere, and so is of limited extent. The way in which this essay is accomplished is in a manner simple and inevitable. Each person of a given species has its trial; if it is successful it survives and hands its life on to its progeny, who are likely to inherit the features which gave success to the ancestor. The parent form having done that which is the highest part an individual can perform must be withdrawn from the field to make room for its successors.

In this way we have the principle of death established as an inevitable corollary to that of advancement. It is indeed conceivable that an organic realm might be so organized that individuals, beginning in the lowest order, should survive indefinitely, and by progressive makings-over, somewhat after the manner of the metamorphosis of insects, keep advancing until they attained the highest estate. But in the world we know it is evident that the system of the succession of generations is an absolute necessity. This is shown by the fact that in all the great series of animals and plants we find that at the beginning the lower forms have no fixed period of life. Some of the lowest protozoa indeed, which seem to be no more than mere protoplasmic aggregates, may in a sense survive indefinitely; they divide from time to time, yet some portion of the structure of the aboriginal parent may inhere in the forms of those of to-day. As we rise in the steps of the series the term of life and the generational succession become more and more definite until in all the higher species both of animals and plants it is almost as certainly determined as it is in man.

It is a very instructive fact that in all the endless experiments which animals and plants have made to better the adjustments of the conditions of their lives to their environment, we find none whatever which look to the indefinite prolongation of the existence of the individual. Although the individual is the absolutely important thing—although it contains within itself all the profit that has been won in all the stages of its ancestry, it is ever and promptly sacrificed to the interests of the life to come. As if it were discerned that the accidents of this world were not of themselves sufficient to insure its certain disappearance when its full reproduction work was done, each of these creatures normally is provided with internal adjustments which surely bring it to an end.

It is difficult to see how this determination as to the duration of life has been established. On the basis of the survival of the fittest, it might be expected that there would be an advantage arising from the perpetuation to the utmost of the approved strong rather than from their replacement by others of a host whence the strong would again have to be selected by a struggle. On the other hand, the extreme selectionist would say that a species which had developed the plan of having quick succeeding generations would have a distinct advantage in the contest for existence with species hampered with the remains of the less advanced predecessors. It is hard to see how this selection with the long arm could have so fixed this method of death in the order in which we find it throughout the organic world.

It is perhaps more natural to assume that the need of death is established by influences which lie outside of the selection field. We must beware of the state of mind of some naturalists—a really unscientific state—which leads them to claim that because natural selection is true, there can be no other like truth in the world of life. We must remember that in animals and plants, quite as much as in the lower mechanical realm, there are establishments of order which are primitive, and which control the conditions of individuals as they control those of crystals or spheres.

Although we shall more than once have to return to this matter of the establishment of death in the organic world, it is well to look now to certain of its aspects. It is to be noted that the individualities of the lower inorganic realm, above the plane of the atom, though they may perish, do so by purely external acts; they do not have any trace of a limit to their normal endurance. It is only when the principle of the advance by successions of generations is established that we have death instituted as a feature in the system. It is thus an innovation—one of very great moment, which has qualified organic life in an absolute manner. It has given to the individual a temporary character; merging its being into the life of its kind; making it but a step in the series to which it belongs. It is this life of the series, developed by the experience of the organic individuals that form it, that is the eminent characteristic of the organic realm.

The institution of the system of the generations in organic forms brings with it the serious difficulty that the newcomers in the field are necessarily weak and dependent on their ancestors for all that starts them on their way. There is in all cases a gulf between the generations which has in a way to be bridged. To the accomplishment of this task goes the greater part of the contrivances, physical and intellectual together, that the organic world exhibits. The work is marked on every hand by innumerable devices ranging from the flowers of plants to the organization of human society. The steps which are taken should be considered in a general way by the inquirer into the true meaning of death, for they show how life, from its beginnings, has been dealing with the problem.

In the lowliest organisms, such as the *Amœba*, the process of reproduction appears to be of the simplest possible kind. The creature spontaneously divides, each of the separated parts taking something like an even share of the original jellylike mass. As there are no specialized organs, every part is able to exercise all of the very simple functions of the creature. This primitive method of increase serves its purpose well. When the body becomes more complicated, when it has organs, the method of simple division is found to be less convenient, so there is a part of the body which is set aside as the field from which the new beings are to be produced by what now becomes a budding process. These buds may go forth as detached individuals, as in the jellyfishes and sea anemones, or they may remain connected with the parent stock, as in the case of the ordinary corals, the sponges, or the buds of the common plants. Although this plan of reproducing by means of offshoots is gradually displaced by the more complicated sexual method, it remains in use throughout the greater part of the vegetable kingdom, and extends among animals to species of tolerably high grade.

While the method of reproduction by the budding process appears to have served the needs of the lowliest organic forms, it does not fit the requirements of the higher life. When retained in the series above the lowest it is most commonly used only to build up a colony of individuals such as we find in the plants, composed of many buds, or a community such as the compound corals present. The tendency to bud appears to hold its place in the animal body long after it has ceased to be in any distinct way useful, reappearing here and there as reminiscences of the remote past, such as we are accustomed to find in the more highly organized forms which seem never entirely to forget the organic steps by which they found their way upward. Traces of the method of reproduction by budding possibly exist even in the mammalian series to which man belongs.

The passage from the original method of reproduction by budding, or the subdivision of the parent body into two or more parts, to that of the seed or egg, is not clearly made out. There is no doubt that the sexual method consists essentially in a process by which two individuals combine each a share of its own body with that of the other, so that the germ is the offspring of two persons in place of one. The selectionist's explanation of the method, in effect, that it gives the young a chance to inherit a larger range of motives and so in a way to help in the advancement of the species, appears to be sound. We may, indeed, account for the establishment, if not the origination, of the method on the ground of its utility. Even in the lowest forms, where we can observe the primitive process of division, it is a notable fact that it is often preceded by the coalescence of two individuals which may serve to give the peculiar advantage of the double ancestry. Thus for a while the limits between the two methods of reproduction remain obscure; but, measured in terms of advancement or of geologic ages, the superiority of what we may term the double method was quickly and firmly established, in time generally to displace the earlier and more simple plan. How momentous this establishment has been we shall note in the sequel.

The bridging of the interval between the generations was not completed by the institution of a well-contrived method of reproduction; in fact, the task was but begun by that contrivance. So long as the organic forms were very simple, so that any part of the body could transmit all the motives of the species, the young having only to enlarge its size in order to attain maturity, the earlier simple method served the needs. But, with the ascent in the scale of living, with the institution of complicated bodies and the creation of the system of germs, necessarily of small size, there came new and serious difficulties. In the first stages of the sexual method we observe that the egg or seed is sent forth from the parent with little more in the way of help from the creature that gave it birth than is afforded by the store of impulses which serve to guide it in development. So far as the provision of food or protection is concerned it must shift for itself, with the result that for tens of thousands born scarcely one attains to maturity. With the spores and germs of the lower orders of animals and plants it may be assumed that not one in a hundred thousand arrives at the adult state. Therefore, we find that about as soon as the spores and germs are contrived there begins a series of experiments in the way of providing food along with them so that the new life may be helped a certain distance on its way by appropriating to its use nutriment gathered and stored by the parent.

The development of the egg and seed from their primitive simplicities to their most perfect estates exhibits a vast series of inventions. Considering only those which relate to the nutrition of the embryo, we remark that the store of food which is thus withdrawn from the body of the parent becomes, in the higher development of the process, a great tax on the vitality of the mother. Many of our smaller birds lay in a single season eggs which much outweigh their bodies. In cases, it is said, a single egg weighs as much as one tenth of the mother-frame. Among the higher plants the provision of food stored with the seed is often of like value, the mass of nutritive matter often outweighing all the other parts of the plant. How good the material thus provided is may be judged by the fact that our civilization rests upon the provision, for it is supported by the grain-bearing plants.

Along with the development of the nutritive store of egg and seed, material provisions designed to carry the germ across the gulf that parts generation from generation, goes a host of other evidences of intellectual and automatic cares which look to the fitting distribution and placement of the young, such as may secure them the best chance in life. In the plants this is shown by contrivances which secure the distribution of the seed by means of wings that catch the wind; by springs which, as in the *Impatiens* or touch-me-not, discharge the tiny bits so that they may fall far from the parent stock. Again, in the fruit-bearing plants, the seed is surrounded by a tempting pulp so arranged that, when eaten by birds or mammals, the seed will be taken with it into their stomachs, to be voided with their dung. This is a most successful contrivance, and the adjustments to make it effective are admirably devised. The seeds of most fruits are hard and slippery, as, for instance, those of an apple. They are thus likely to escape the crushing action of the teeth. They are also so organized that the high temperature to which they are subjected in the alimentary canal is advantageous to their development, as is shown by the fact, well known to gardeners, that such seeds are more easily germinated if they are soaked for about twenty-four hours in water, at a temperature of about one hundred degrees Fahrenheit. This gives them the preliminary treatment to which they have been adapted. When such seeds come to the earth it is along with a store of fertilizing material which serves to hasten the early and more perilous stages of their development.

Yet further marks of the care of plants for their young are seen in the contrivances to increase the temporary adhesion of the seed to the hair of animals. These, from a mechanical point of view, are wonderfully well designed, the general shape of the structure being so made that it clings firmly. The hooklets are peculiarly adapted to the quality of hair or wool, and the normal height of the seed vessels above the ground is so arranged that they may come in contact with the bodies of the creatures to which they look for transportation. The finish of the contrivance is carried even to the fine point of arranging the hooklets so that they may not hold on too long, for at a certain stage of their drying the clinging points become brittle so that they break at a touch, allowing the seed to fall to the ground.

Admirable as are the devices by which the germs of plants obtain a distribution favourable to their well being, they are of small account as compared with those for like ends we see in the animal kingdom. In that higher field we find not only the mechanical adjustments, such as those we have noted among the plants, but a host of others that are the result of the individual intelligence belonging to animals alone. Although the very first signs of mental activity appear to be directed to the immediately personal ends of obtaining food and avoiding danger, the highest manifestations of intellectual work below the level of men are to be found in the contrivances designed to better the chances of the young. These are so numerous that I shall not try even to indicate their range or scope. I shall note, indeed, but one which happens to be so far indicative as to be of value not only here but at other stages of our inquiry. This is what may be observed in the nesting habits of the ordinary mud wasp, a widely diffused species, one that is familiar to all observant persons. This creature belongs to a group which, as in all advanced forms, is noteworthy for the care they take in making provision for their young. That of which we have to tell the story is, in the measure of its contrivance, scarcely beyond many others of its kindred.

The arrangements which the mud wasp makes for the care of its offspring are as follows: At the time for nesting the female proceeds to search out a suitable place for constructing her egg cases. In this choice of a situation she shows a singularly effective insight into the accidents of the weather. She selects places, such as those in the lintels and jambs of a window, where the nests will be tolerably sheltered from the washing action of the rain, yet she appears to discern that they should not be perfectly sheltered from it. When she has found a fit site she searches for clayey mud, such as will become firm when dried. The material is gathered with rare skill, the quality varying but little wherever we find it used. With this clay she proceeds to construct a small cylindrical case a few millimetres wide and about three centimetres long; rough on the outside but smooth within. When this task is accomplished she goes forth to seek spiders of small size, limiting the choice to a few species, oftenest only one kind is taken; these she stings with care so that they may not be killed but only benumbed, in which state they may lie for weeks. These spiders she packs into the chamber until it is well filled. Then on these spiders she lays an egg and finally seals up the mouth of the chamber with a thin covering of clay. This process is usually repeated until several, rarely more than half a dozen, of these cases are formed, one beside the other. There being a certain saving thus effected in the mud, which is precious because of the difficulty of transporting it, she then, as if unwilling to venture all her eggs in one basket, seeks another site for other like constructions.

Shortly after the egg is laid beside the numbed spiders, the young grub comes forth and proceeds to feed on them. When, in the course of a few weeks, it has eaten the last of the store, it has grown to the limits of the lodging place. It then enters on the chrysalis state, undergoes in time its metamorphosis to the perfect insect. If it be a female it then proceeds to repeat those marvels which it has never seen done, and which it can not possibly be taught to do by its predecessors, for they are all dead. We have here two groups of facts; on the one hand, the delicately adjusted processes by which this task is accomplished, all involving what is, in effect, a singular anticipation of the career of the unborn young, transformations which the mother can not possibly have seen; and the other, the institution and transmission from generation to generation of the impulses or desires which lead to the actions just recounted.

All through the animal kingdom, in fact in almost every species, we note actions, which though they may be less picturesque than those exhibited by the mud wasp, yet are, in their essence, equally marvellous and serve quite as well to show the great intensity with which the actions of animals are directed to the end of handing on to the generation to come the largest possible share of help that the passing members of the species can afford. We see, even in the lower stages of life, that this care for the unborn, such as is, or at least should be, the main theme of our human society, is the basis of all the higher endeavours of the creatures. We see that it goes further than any other motive in lifting their intelligence to a high order of development; for, however we may take the work of the mud wasp, it remains as the work of mind; doubtless unconscious, automatic in a sense, yet for all that the work of one mode of mind. We see, moreover, in these deeds of two million or more species of insects and a host of birds and higher animals, one clear object, which is that their successors may pass over the gulf between the generations not only unharmed, but helped in every possible way. They do not know that what they do is an offering on the altars of self-sacrifice—they do it because it is their nature thus to serve.

The lower series of organisms, as before noted, effect their reproduction at first by a simple method of dividing the body; later on the method of the egg or seed, more or less combined with some survival of the primitive plan of budding. In the insects where the methods of propagation are most elaborately worked out, the care of the offspring at many points attains even more elaboration than is exhibited in the solitary example above described. Though as yet but a small part of the facts is known it would be an easy matter to fill the pages of a dozen volumes with the accounts of the contrivances which have been resorted to by the animals whose young come forth into the world from eggs. They all tell the same story of progeny necessarily turned out into the sea or air insufficiently developed properly to shift for themselves, needing all the care, at best but little, that the passing generation can contribute to their welfare. The difficulty of the situation may be judged by the fact that these oviparous creatures send into the world probably not less than an average of a thousand young for one that, in the chances of life, attains maturity.

All along the various series of animals that have a high order of development we find contrivances of exceeding variety which have for their purpose something like the temporary adoption of the young into the body of the parent. With many spiders these young cling to the mother. In certain molluscs wonderfully elaborate egg cases are constructed for them wherever they may dwell in their period of first weakness. In some of the unios, or fresh-water clams, there is a sac adjoining the gills where they may find temporary shelter. In the pipefish there is a pocket in which the young lodge. In the Surinam toad the eggs are placed on the back of the male when they enter the skin, forming pustular structures wherein the embryo perhaps obtains some nutriment from the parent. But none of these efforts to afford more than the ordinary protection to the egg are successful until the method is devised of having the mother provided with milk-giving glands so arranged that the infant can obtain the fluid. By this device, which is the consummate invention of the class to which we ourselves belong, the offspring is made free to what is, in effect, the mother's blood for a period of from a few weeks to two years or more after extrusion from her body. This system has other than a mere physical value, for it keeps the infant in contact with the mother—often with both parents—for a much longer time than otherwise would be the case, and so aids in the establishment of the foundations in which the family rests.

At a later stage in the advance, along with the development of the function of milk-giving goes the permanent institution of the method whereby the egg is hatched within the body of the mother and the young brought forth not only alive, but much advanced in their development. Approaches to this system, tentative but never really successful efforts to attain the end, are to be noted among various of the fishes and in a way among the invertebrates. Thus, in certain species of sharks and in the viviparous bony fishes, the eggs are hatched within the parent's body and the young come forth with a size which they could not have attained from the resources of the egg alone; they have clearly, by some means or other, obtained nutriment from the mother, probably from the passage to them of the fluids of her blood, by the process of osmosis. But the earlier essays were only the forerunners of the great and successful experiment of the mammals in the process of gestation, the development of the placenta, an invention which, perhaps more than all the others that have been made in a physical way, effectively bridges the ancient gulf between the generations, at least so far as the physical machinery of the body is concerned. In its perfected form the union before birth is so complete that the young is an integral part of the body of the mother. All of her constructive powers are at the command of the new life, all of her strength which may be needed is automatically directed to the work of nurture.

None other of the many great series of organic events show us anything like the array of physical contrivances and intellectual inventions all directed to one impersonal end as this admirable succession of deeds relating to the care of offspring. Even when we explain this work by natural law we in nowise lessen its majesty or that of the system which bade it take the shape we find.

As the naturalist looks back over the long perspective of life, he sees, indistinctly it is true, but clearly enough for the immediate need, how the development of the organic individual introduced into the universe a new kind of unit, one differing from all the lower units previously existing in that it was educable, it could garner experience and profit thereby. He sees that this provision for an indefinite advance requires the development of the generational order, as is shown by the fact that the method is instituted and affirmed in all the groups of animals and plants, and that in the process of advance it is made more definite and unalterable. He sees, furthermore, that there comes out of this plan of education a host of difficulties and dangers arising from the isolation of the successive individual lives and the apparent impossibility of bridging the chasm between them. When the work is beheld as accomplished the whole seems so well united, the parts are so linked into a whole that the observer is apt to accept it and pass on without due attention to what has been really effected. It is best that he should attend to certain features of this series of events which may help him to an understanding of the problems of life and death.

Let us first note the apparent difficulty, that there is no profit to the individual in its own death; yet we see that the life of its kind, which is its own being together with that of its fellows, proceeds as rapidly as possible to establish a term for its endurance which is as brief as is consistent with the attainment of maturity and the care of the possible offspring. If a day will serve, then it is but a day. If it demands more time, then so much and no more, the point being that the sacrifice in the interests of those of the kind that are to come must be as complete as is required. The claim of the person itself is to count for nothing. Considering again that the actual life is that of the individual, this devotion of its interests to an ultimate purpose is most trustworthy. We must seek an explanation of it.

As before stated, the extreme selectionist would account for the enforced brevity of the life of the individual by the doctrine of vital economy; i. e., by the supposition that it was advantageous to a variety or a species in pressing forward to have the successive generations produced as rapidly as possible, each with its active host unencumbered with the *débris* of ancestral forms presumably less advanced and most likely unfitted by the hard usage of time to contribute a fit return for their subsistence drawn from a general store. At first sight, this view has a certain appearance of probability; it is, indeed, one of the unhappy qualities of all the propositions of the selective hypothesis that they have an appearance of certainty which leads the novice to feel that they hardly need verification.

To all those who appreciate the real value of the Darwinian method of approaching organic problems this false certainty which comes with the statement of his views is a matter of regret, for the reason that it endangers their eventual place in the science they are so well fitted to help. The reason for this peculiar position of the hypothesis is to be found in the singularly question-begging quality of the phrases which are necessarily employed in the statement of the proposition. The word "selection" implies an absolute choice, and the term "natural" apparently adds a quality of certainty to the action. We have to remember that the influences which make for or against the life of individuals and species are very numerous and complicated in their interactions. Occasionally the life of a species is terminated in some sudden and catastrophic manner. But commonly it passes slowly and as a consequence of a great array of actions. Further, we have to remember that in no immediate sense can there be any struggle for existence or survival of the fittest between two or more species; all such relations are between individuals. That these individuals happen to group themselves in an order of classification in our minds, in no important way affects the processes of their life and death. The interaction is between units. With these points in mind we will examine into the question of whether the process of the survival of the fittest can well account for the establishment of a definite longevity in all the various series of animals and plants which, to the number of some thousand million species, now tenant or have tenanted the earth. The first point to be noted is that in all the individualities below the organic realm there is no trace of a rule that the unit shall at a certain time disappear; dissolution is common enough in all forms above the plane of the atom, but the change comes, so far as we can see, always from external actions, and not from any internal determination. So far as the general order of events in the visible universe goes, it shows that death, systematically instituted, has no place there.

We do not know what the first forms of organic life were: they could hardly have been much more uncomplicated in aspect than the lowest of the protozoa of to-day, which appear to be in structure mere bits of slightly animated jelly. They may reasonably be taken as types of life in its simpler conditions. As yet there is no sufficient information as to the longevity of creatures such as the *Amœba* and the kindred lower species. All that we know of them, however, indicates that there is no fixed period of death; that they continue the process of growth and division until some external action brings the end. In fact, among all the lowest members of the several great series of invertebrates, the definition of the term of the individual existence is not exactly made. There is a period of youth followed by that of maturity which shades into age on the way to death. We can, in a word, see that very gradually, yet irresistibly, the plan of having the persons of the species pass away is worked out. So far as we can discern, the result is in all the series very slowly attained. Now, the probability of any accidental characteristic being affirmed by natural selection in large measure depends on the distinctness and effectiveness of the offering. We have to recognise that the survival of an individual, and through it of the species to which it belongs, depends, not upon any one feature, but upon a vast array of structures, functions, and habits and their interactions with a complementary array of conditions presented by the environment. In this battle for life and success, in which there is a host of interacting needs, there may be some one of them so strong and swiftly acting that to it alone the decision may be immediately due; but to have any such efficiency the particular feature must be of great value in the contest.

Let us suppose that of two groups or species of individuals in the lower parts of the organic series contending for the possession of the same field of subsistence, one, which we will term "A," had developed a somewhat more definite longevity than the other, which we will designate as "B." We are to regard these differences as very slight as compared with many others which may exist, for the reason that, save in the higher forms, they are evidently ill defined. Let us suppose also that in each of these groups the other differences of value in the equation which determines life or death number, say, fifty (the probabilities are that they far exceed that estimate); let us suppose, as we well may, that many of these features, such as those which relate to obtaining food or mates, or those which contribute to safety, are one and all of more immediate effect upon the chance of individual survival than the difference in the longevity can have on the chance of the species as a whole. If we grasp this complicated suggestion we see that the probability of A by selection displacing B appears to be exceedingly small. There are other considerations which may be urged by the extreme selectionists, but they all appear to fall before such criticism as that made above, which rests on the considerations that the determination of longevity proceeds very slowly; that it is not only of no advantage to the individual, but it is of maximum disadvantage to it; and that as between competing species the slight variations—slight alike in amount and in value—would probably be of no account in the presence of the great host of telling characters on which selection would naturally be determined.

It appearing to be more than doubtful whether the principle of a definite life period can be due to external selection, the question arises whether any internal process of that nature could have brought about the result. Although biologists have not been disposed to consider the interior of an individual as affording a field for selective work, there can be no doubt that determinations, essentially selective in their action, go on within the bodies of animals and plants, especially in those of high grade. In highly organized forms—i. e., those with many organs more or less independent, parts centred in one individuality—these parts apparently may enter into a certain competition one with another for the strength of the body, with the frequent result that some feature is so developed that it becomes a source of weakness to the life of the whole. This motive of excessive growth probably is the source of death to some species, for it is a noteworthy fact that in tracing the successions of ancient forms whose record is written in the rocks, that the most aberrant species have but a short life, and that their death appears to be due to the excesses of development. But there is nothing in this interesting, though obscure, group of phenomena to in any way indicate that the establishment of a definite longevity can in any way be due to advantages won by internal selective processes.

In view of all the facts, it seems most reasonable to suppose that the source of the actions which make for the institution of death at a fixed period of life lie outside of the limited field of natural selection; that the condition is enforced by laws such as control the other forms of matter, which determine the shapes and other qualities of the atoms, molecules, and crystals. The most extreme selectionist will hardly seek to maintain that everything that takes place in the organic realm is due directly or indirectly to the survival of the fittest. This field of Nature is as much within the limits of the ancient physical realm as is any other part of the universe. It is, in fact, but a small part of the inorganic matter that makes the earth which for the moment has come into the peculiar organic state. In a word, it is but a temporary manifestation of the life of the universe which normally abides in the lower modes of existence. We see that this matter takes on new functions with each change to which it is subjected. It has one mode of action in the atom or molecule, another in the crystal, the gaseous, liquid, and solid state; but these are in nowise founded on the principle of immediate profit and loss. As such, indeed, we may regard the institution of death at a fixed period. It is clearly in a large though remote way vastly profitable to the interests of life in general. It is not possible to see how advance could so well be made with the need of removing all the ancient and defective individuals from the earth by some other process. It is in every way better that they should quietly give place to their successors, who are better fitted to do their work. But this passage is not the result of selective action due to the survival of the fittest. It appears to be an act of sacrifice which is enforced on the individual by a power more remote than the acts of its own ancestry, summed up and transmitted by the process of inheritance.

CHAPTER III

THE DURATION OF THE INDIVIDUAL LIFE

We have now to consider the question as to the duration of life in the individuals of the different organic groups. In the several series of plants and animals the determination of this period has led to rather varied results. In the lower members of the numerous series there is usually a somewhat wide range in the longevity of the persons. They appear gradually to wear out rather than to end at a definite period. As we rise in the scale of organization in the several organic series the term becomes more fixed, as by a law of the organization of each species. In general, it may be said that longevity is a specific characteristic rather than one belonging to larger groups. It often happens that two rather closely related kinds of animals or plants may differ much as to the time when the decay of the body normally sets in. The range is greater in the vegetable kingdom, where kindred species may differ in the ratio of one to a hundred. Usually, though with many evident exceptions, the higher the structure the more likely it is to be limited as regards its duration; and also that, the larger the form the greater the probability of an extended life.

In many cases the longevity of a species is immediately adjusted to the climatal conditions in which it dwells. Thus, among the insects as well as many marine invertebrates, the duration of the individual is often fixed by the advent of frost or drought, the economy of the creature being so arranged that all of its kind pass the winter or the dry season in the egg state. Probably more than ninety per cent of the species of insects have this habit, and are thus limited to a very brief term of life; one which rarely exceeds half the year. As insects apparently constitute more than four fifths of the total number of animal species, it follows that by far the greater part of that kingdom endure for less than a year.

Among the plants the seasonal limitation of longevity is quite as characteristic as among the animals, though it usually has a rather different mode of expression. In perhaps more than half the species the winter season is passed in the seed state, just as among the insects it is passed in that of the egg. In many forms, however, the roots live on though the tops in part or altogether die and all activities are suspended. It is a curious fact that this seasonal relation of the life of the plants and the invertebrates is not limited to those kinds which have been developed in the regions where frost occurs; it is nearly as noticeable in the tropics as in the lands beyond them. This is probably to be explained by the effect of the dry months, which so often in equatorial lands brings a pause in vitality much like that induced by freezing.

While the seasonal processes fix the life term of nearly all the invertebrates, as well as the greater number of the plants, many kinds escape these determining conditions. In the sea only the surface and the shallow-water forms feel the annual changes of temperature; those of the deeper zones are independent of them. Our molluscs, generally because of their migratory habits, which take them somewhat away from the shore line in the winter, are protected from the trials of that season. Although the plants do not migrate, their capacity for suspending their vital processes enables them to build very large communities, such as our trees. In a strict sense the commoner trees and shrubs are not individuals, but communities, in which each bud is to be reckoned as an individual, the whole plant resembling in most regards an association of polyps, such as form our stony corals. Thus, while some of the greater trees, such as the sequoia, may perhaps attain a longevity of several thousand years, their life is that of a community; their individual buds have no such endurance; they are oftenest limited in duration to a single year.

The most instructive variations in the measure of longevity are afforded by the species of articulate animals. As before noted, by far the greater number of these have an annual term, one half of which is taken up by the processes of the egg. But among the marine articulates the life is often prolonged for years. Some of the larger crabs and lobsters probably endure for ten years or more; a few species may live on to near twenty years before attaining their fullest growth. Again, among the insects, while the perfect state is generally limited to a few months, certain of the bees live for years, and the same is probably true of the ants. As a whole, the lower life of both animal and vegetable kingdoms shows us a tendency to organize the individuals on the basis of what we may call the seasonal term. When we remember that all the organic forms are essentially the product of solar energy, it seems fit that they should awake with the coming of the sun and sleep upon its going.

When we rise in the scale to the vertebrates we find at once a very great change in the duration of the individual. In no instance, so far as I have been able to find, is the life of a member of this group in any distinct way related, as in many lower animals, to the seasons or limited to a single year. The breeding period is determined by the seasonal changes, the greater number of the species having a definite age when they may breed; but in no case do the members of the species pass away at the end of one such period. Thus, while in the invertebrates and plants the reproductive process comes to be the natural finish of the life term, it is never the case with the vertebrates. So far as I have been able to find, there is no instance where there are less than about a dozen breeding periods in the life of an individual vertebrate. Thus, in the vertebrates we have a general prolongation of life for a term much beyond that of any of the other types, unless it be possibly the *Mollusca*, a group which is by some naturalists regarded as more nearly related to the backboned animals than is any other of the lower series. Even there it is not probable that the individuals have nearly as long a term of life as is shown in the vertebrates.

In all the lower parts of the animal kingdom except the insects, as has been previously observed, there is a lack of anything like a clear definition of longevity. The creatures wear out in time; as soon as they weaken they are likely to be overcome by their enemies, or crowded out of the chances of subsistence by competition of their own kind. It is much the same with the lower vertebrates—the fishes, amphibians, and reptiles. In most species of those groups there is no distinct period when they are by degrees prepared for death. In the greater number of the kinds there is not even a definite age when the growth ceases. There is reason to believe that among some species of fishes life may be prolonged to decades. It is claimed, on what appears to be fair evidence, that the carp may sometimes live for a century. The same appears to be the case with the reptiles: though there is a general size for the adults a slow growth seems to be indefinitely continued. As for the longevity in the reptilian series, it is most likely rather greater than among the fishes. In the tortoises it seems probable that it extends to a century or more. It is otherwise with the amphibians, at least with the frogs and toads; there the body quickly attains a fully definite maximum size, which is probably associated with a rather brief life term. The lizardlike members of the group, the water dogs, newts, and their kindred, are rather like the reptiles and fishes in the indefiniteness of the term when growth ceases. The peculiar limitation in size in the frogs and toads may be connected with their activity as jumpers, it being characteristic of the active species of animals to have their maximum bulk rather accurately determined.

It is when we come to the birds that we begin to find a moderate degree of definiteness established for the term of life. In all the members of that group there is a distinctness in the period of growth which is measurable in years, if not in months, such as is found in none of the lower classes of vertebrates. The maximum size of individuals in each species is determined within narrower limits than in any other of the type; this appears to be the most complete in the flying forms, the ground birds exhibiting a much greater individual variation. The reason for this may be, as in the case of the frogs and toads, that the high order of activity of the creatures requires a precision in their organization; a fitness to an exact mould which is not necessary in forms which have a less definite adjustment to the work they have to do. The insects are an admirable example of the result of a high order of activity, and, consequently, of a very precise accommodation of their bodies to an intense and definite round of existence, as is shown by the remarkable uniformity in the size and shape of the individuals of the same species.

As for the longevity of birds in their normal free state little is known, and that little is limited to a few species. There is evidence to warrant the assertion that the term of life is fairly well fixed, being in this regard only less determined than in the mammals; the range being about the same as in the higher class. At the shortest it may not exceed four or five years. For the longest, as in the case of the parrots, it may extend to near a hundred. In the birds we find rather clearer evidences of a limit proper to each species than in any of the lower types of the vertebrates. There appears, moreover, to be traces of an old age period. This may be noted in our caged birds and barnyard fowl, when males and females which have passed the term of reproduction sometimes for years drag out a miserable existence, deprived of all the impulses which inspire the life of their fellow-creatures. In the wilds the bitter struggle for the chances of food and safety probably brings the end as soon as the vital powers feel the touch of age. Although they are ever fighting for life, birds appear to be supremely joyful creatures. Their existence is one of incessant and merry activity, and death comes so quickly to the enfeebled that they suffer but little.

In the *Mammalia* the definition of the growth period is, in general, much less distinct than among the birds; but, so far as I have been able to find, the longevity is more accurately determined, though the range in the various species is probably considerably greater than among the feathered creatures. Among the mammals, as elsewhere, the large forms seem to be the longer lived. With small species, such as the lesser rodents, the term is probably from three to five years; squirrels certainly live longer; they may attain to ten years. The small *Herbivora*, such as the sheep, have a normal life of ten or twelve years. Our bulls live to perhaps twenty. Horses under the extreme care that is at times given to those valued, because of memorable associations, have lived to between thirty and forty years, but they bear the marks of old age at thirty. There is evidence, of apparent validity, going to show that elephants may live for more than two centuries. This has been questioned, but the undoubted fact that there is some proportion between the bulk and the longevity affords some warrant for this reckoning. It is in the order of the facts that this, the largest of the land vertebrates, should much exceed the others in duration.

It has been held that there exists a tolerably definite ratio between the length of the period of growth and the normal duration of the life of a mammal, and that the longevity can be reckoned by multiplying the years of adolescence by five. It is easy to see that this reckoning does not apply to the birds, for there the growth period, with few exceptions, is about the same, while the duration of life is exceedingly varied. For reasons before given it has no application to the other lower classes of the *Vertebrata.* In the mammals it may, as a general proposition, be regarded as approximately true, at least in those instances (in all but few) where we know at once the duration of adolescence and that of the normal longevity. As regards the term of growth, it is found impossible to fix its upper limit with any great certainty. The consolidation of the epiphyses of the long bones, which is generally taken to represent the end of the youth period, is of value only so far as the growth of the bones in question is concerned. The coming of puberty is of no value, as in practically all cases it much anticipates the cessation of growth. Still, in a general way, we can say that sheep are adult at somewhat less than three years, while they may live to twelve; horned cattle at about four; they may survive for twenty. Horses are full grown at five or six and often survive to thirty years. In the elephants full growth seems not to be attained until about the fortieth year, and, as I have noted, they probably may endure for two hundred.

In man the growth period is normally continued to some time after the twentieth year; its exact limit has not been ascertained, but, from the statistics gathered by the Sanitary Commission during the civil war, it seems most likely that it is not usually completed until after the thirtieth year, and may continue yet later. This result is indicated from grouping the measurements of American-born soldiers according to age. It affords a better basis for the determination than that obtained from the consolidation of the bones in the limbs, and may be fairly accepted as well founded. As the natural longevity of man can not be reckoned at more than one hundred years, that being the limit of anything like a sound mental or physical life, it is evident that the term of five times the period of growth is not attained in our species. It is not necessary to say that the reason for this departure from the apparent rule of the *Mammalia* in our own kind is a matter of very great importance. So far little attention has been devoted to it; in fact, as we shall see, the problem is one of singular difficulty.

In looking into the history of the apparent shortening in the term of human life, we should first note that the basis for the computation as to the ratio between the period of adolescence and the endurance of the body to the tax of time is not wide enough to give any very high value to the assertion that among the kindred of men it is in any very definite manner established. Of the many hundred of species in the class of mammals the proportion is approximately known in perhaps two score. It is quite possible that the determinations which have been made in the consolidation of the epiphyses have led to an underreckoning of the period of youth. It may therefore be that the shortening of the human term is not so great as it appears. Nevertheless, the evidence is decidedly in favour of the supposition that the normal longevity of our own kind has in some measure been diminished. The extent to which this is the case must await further study as to the time of maturity and the endurance of the anthropoid apes, the nearest kindred of our kind. On this point we have no trustworthy information: the inductions from the length of life these species attain in our zoological gardens is of no more value than would be that concerning the longevity of man which might be gathered from the records of our hospitals and prisons.

Such abbreviation of his normal life as may have come to man can perhaps be accounted for by his peculiar position in relation to his habits and his environment. Upon him have come certain burdens and demands which the lower creatures have not had to bear. As these are not generally recognised, and as they have relation to the question as to the prolongation of life which we have to consider in the sequel, I shall give them a brief consideration.

The most eminent peculiarity in the physical conditions of man is his upright position when in activity. This attitude, or a fair approach to it, is common enough in the higher apes as an occasional position; one taken when they are looking away and need to bring the eyes as far above the ground as possible. But for walking or running it is entirely limited to our kind, the nearest approach to it being in the jumping forms of the kangaroos or in the rodents of like habit, such as the jerboas. That it has been a long-continued habit in the ancestry of man is shown by the extensive changes in the proportions of the body which it has induced. These are notable in the foot, in the pelvis, and in the relative length of the fore and hind limbs. These differences are of such importance that on them alone we are entitled to regard man as a species far removed from the most humanlike ape that has as yet been discovered in a living or fossil state.* If the intermediate forms between man and the highest of the living apes are ever discovered, we will have, not a "missing link," but a long chain made up of many species.

One of the effects of the upright position of man, perhaps the most important for our problem at least, is the increased tax which it puts upon the strength of the creature. The draught it makes on the body is in part shown by the difference in the rate of the pulse when lying down and when standing up. This often amounts to about twelve beats in the minute, or as much as one sixth of the average pulse rate. While many four-legged animals can sleep in a standing attitude, any repose in that position is denied to man. It requires the ceaseless activity of many muscles to keep him erect. There are various secondary taxes which the vertical trunk and the consequent great relative height inflicts upon us. That trunk took its shape in the long experience of our kind from the fishes upward. It was formed in the thousands of species through which our life came in its later vertebrate stages of ascent. In that original position parallel to the earth the several organs of the viscera, heart, lungs, digestive system, the reproductive apparatus, found a fit storage; no one of the parts to any considerable extent presses upon the other. When, however, the trunk is brought into the vertical position these organs press one upon the other in a way that tends to produce serious dislocations and diseases. It is not unlikely that the price man has to pay for converting his fore limbs to the higher uses of his will, the inestimable price for a very great gain, has had much to do with his general liability to disease, and the consequent relatively brief duration of his career.

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* The fossil remains of a creature recently found in Java, and supposed by some naturalists to represent a species intermediate between man and the manlike apes, appear to the writer most likely to be those of some small-skulled degraded human being such as are often found among idiots. This matter must be regarded as still in debate.

Another possible cause of the diminished longevity of man is to be found in the very exceptional conditions of his breeding habit. In the *Mammalia* in general, probably in all the larger species up to man, with the possible exception of the apes, there is a breeding period arranged with reference to the seasons, so that the young only come forth in the plenteous time of the year. There is no doubt that this limitation of the reproductive functions to a part of the year tends to diminish the tax upon the life of the individual. The process is certainly taxing on the vitality; any such reduction of it as is afforded by the long pauses of the function, such as occur so generally below man, may be expected to have an effect in prolonging life. In man, however, and perhaps in some of his simian kindred, there are no such breaks in the reproductive duty from the time the task begins until it is ended with old age or death. The need has apparently been to push this part of the work of the body as rapidly as possible, so that the risk of loss of the individual by a premature death might be lessened.

It would be an interesting task to trace the possible influences which have served so to change the breeding habit of our species from that we find in our lower kindred. We can, however, only note the fact that reproduction in the lower life appears commonly to be adjusted to the conditions of sustenance. As before remarked, the arrangement is in general such that the first stages of the new life are begun where the parents have had a chance to profit by the time of the year when food is most abundant. The coming forth from the mother occurs at a season when she has the best chance to nourish the young from her teats, and when the offspring may soon have opportunity to shift for itself. In the case of man we note that, being in his origin a tropical creature, he probably had from his ancestry a less definite seasonal relation of his reproduction than those of his lower kindred that dwell in higher latitudes. Moreover, his miscellaneous habits of feeding made his sustenance at different times of the year more uniform than those of any other animal. It is likely that this uniformity in the quantity of the food supply has had something to do with the change.

As to the longevity of the different varieties of man, there appears to be no other difference than such as may be well accounted for by the accidents of their lives. Negroes, American Indians, Chinese, Semites, and Aryans, so far as survival goes, all fall into the same group. Some of the tropical peoples have appeared to good observers to be evidently shorter lived than Europeans, but this is not proved. The cases cited are always those of conspicuously ill-fed tribes. This uniformity points to the conclusion that the establishment of longevity was affected in the prehuman series, and that it has been well imbedded in the habits of the body, so that if not unchangeable, it is at least obstinately fixed. This is made to appear the more likely from what we know of the adherence to the established duration of life in our domesticated animals. Some of these species, as, for instance, the dogs, have been very greatly changed from the parent stock, and this in many different ways; but, so far as we can see, there has been no sensible alteration in the limit of the individual life. The larger varieties are perhaps somewhat the longer lived, but the contrast is apparently no greater than it is in mankind. Between a Great Dane and a tiny Mexican spaniel there is a difference in bulk of perhaps one to twenty; but the longevity of the larger form is certainly not twice that of the lesser.

In various myths, especially in those of the Jewish sacred books, there are accounts of men having lived to an age several times as great as that to which experience shows that mankind really attain. It has reasonably been conjectured that these statements may be due to a transfer of a reckoning in moons—the common primitive measurement of time—to the later method of accounting by years.

So far as accurate records indicate, it seems eminently probable that no man has attained to a greater age than about one hundred and five, or at most to one hundred and ten years. When we consider that each year some millions of people die concerning whom there is sufficient record to fix the time of their birth to the year, and that this condition of our information has existed in some countries for centuries, the fact that we have no well-attested case of survival through the eleventh decade is very impressive. It shows clearly that if there be instances such as those claimed in the cases of Parr or of the Countess of Desmond, where life has been prolonged to about a century and a half, they are very exceptional; nothing but a complete chain of evidence, such as does not exist, would warrant any consideration of them. It may be said that all the alleged instances of survival beyond eleven decades have on examination proved apocryphal.

CHAPTER IV

THE NATURE OF INDIVIDUALITY

It has been necessary in the preceding chapters to use the term "Individual" without giving it the definition which it evidently needs. To discern the large relation of the term we must first notice that it is by no means limited to ourselves, or even to the organic realm—it concerns the whole of Nature; for, as has already been noted, every part of the material universe as to which we have knowledge reveals individualities.

Looked at in a broad way we may thus define an individual: Wherever in the natural realm lines of action, or of action and resistance, are so related that a localized movement is established, then, for the time of the localization, we have an individualized part of the whole. If, as seems likely, the ether oscillates in the passage of energy through it, then according to this definition each of these moving parts is, while in motion, to be accounted an individual, the simplest we can as yet fairly conceive, though there may be an endless succession of lesser included centres of activity in the infinite of the small that lies below that apparent infinitesimal. When single impulses of energy act on matter, the individuality created thereby may be regarded as temporary, for as the impulse is passed on the action ceases. But it is evident that in Nature various impulses concur to establish more or less enduring assemblages of actions at certain points in the realm. These are, in their various grades, the individualities we are considering.

We can form no very clear picture as to the precise mode in which the natural forces combine their action in the creation of an individual; but we are probably not leading ourselves astray if we give them a diagrammatic expression by means of very numerous, perhaps innumerable, straight lines passing in any direction through space, they having in effect endless differences of value. These lines may be taken to express not only action, but such resistances as those of inertia, etc. When these lines intersect, according to the proposition, we would have a centre of action of movement of some kind or kinds. If the actions were simple and balanced, they might conceivably give rise to the atomic unit, or lowest grade of permanent individual. We have now to conceive that each of these simple products of energy, or of energy and resistance, becomes, in turn, a centre from which new forms of action go forth. Out of these and the continuing antecedent actions arise higher, compounded units, each in proportion to its gain in grade becoming more and more a centre of influence; sending impulses in a larger share to the environment and, in turn, receiving more therefrom; becoming more potent with every advance and enlargement, but at the same time becoming commonly more unstable, more certain, in the end, to fall before the storm of actions. We properly imagine the forces of Nature to act continuously and with equal value under like conditions, but we have to bear in mind the fact that when two or more variable streams of energy each qualifying the other, are acting together, we must expect to find sudden changes in the measure and even in the essential nature of the result their action produces.

I have in another chapter chosen the critical points of water for illustration of this and other features, for the reason that they are familiar and their effects may be easily apprehended, not because they are in any way peculiar (see p. 293). They are but a part of an infinite number of just such actions as are everywhere in progress in the fields of Nature—in the organic as well as in the lower realm of purely physical activity. In fact, it may be taken as a truth of wide extension that while the operations of energy in the visible universe are on continuous lines their results are broken by various processes of interference with substantially the same kind of result as we find in the conditions of water under the influence of heat, with resulting sudden changes in the nature of the phenomena, though the actions themselves exhibit no such sudden changes. It is not very difficult to see how, in any centre of many impulses and resistances, what we have termed the essential individual, the equations of the forces would necessarily result in stable balanced conditions being formed from time to time, each followed by sudden rearrangements of a catalytic sort arising from the access of a new impulse, or a change in the value of some one or more of the old. It is interesting to note that in certain mathematical series there occur breaks in the succession where the order of succession might well be supposed to lead to continuity. Thus, in this ghost of the real world which mathematics affords us, we see what appears to be the same principle of critical points which we find actualized in the material realm.

The foregoing ideal picture of the manner in which natural impulses are related in the centres in which they interact one upon another is most likely far from expressing the full truth of the matter; but it pretty surely contains much that is true, for it helps us greatly in our efforts to conceive the nature of individuals of diverse grades as well as many of their phenomena which would otherwise be inexplicable. Beginning with the atom, we find a reason for its unchangeableness in supposing that it represents the action of completely equilibrated forces so conditioned that they are not effectively interfered with by any others from without or within. The molecule, because of its greater internal complication, is presumably less stable in its organization, and, because of its more extended relations to other bodies, is more readily affected by disturbing influences. In the exceedingly complicated molecules of certain carbon compounds, wherein there are hundreds or thousands of atoms, and where the external and the internal conditions begin to have entangled relations, the measure of instability due to the occurrence of critical points naturally becomes great. While the individual atoms may receive strains which tend to their disruption, it may well be that the equations of their forces are stable enough to resist change in all the conditions which we can apply to them. But with the complicated molecules it may be otherwise, for they necessarily have a far larger field of relations than the units of which they are composed.

On the considerations above suggested we may somewhat enlarge our definition of an individual from that just made by saying that it is a plexus where natural impulses are combined to produce new results which are likely suddenly to come about. It follows from this that each individual is sure to be in some measure a centre of organization—not of energy, for the sum of that is constant, but of new modes of operation of that energy. It follows also that the individual, in proportion to its complication, enters into relations with its environment, giving and receiving more and more varied impulses with its rise in complexity, and therefore becoming necessarily with its advance ever more unstable. It does not necessarily follow that this instability leads to final destruction of the individual, though it must tend in that direction. It may happen that the large number of the interactions may indeed insure its perpetuation. In any finite aggregate of high order where the static conditions of the atom or the molecule can not be attained we should expect the instabilities to result in the end in dissolution at some critical point.

If the above-stated view as to the nature of the individual be correct, we see that there are certain clearly evident relations between the organic and the inorganic units. They both alike receive energy, and transmit or transmute it; they both exchange relations with the environment; they both increase in instability—i. e., in the measure in which they affect and are affected by their surroundings as they advance in complication; they both are due to some kind of centring and balancing of physical impulses; they differ essentially in that the organic individual has acquired a capacity for successive changes due to the appropriation of experience, and that it has acquired ways whereby this experience can be transmitted so that its results may be accumulated in successive forms. In a word, the organic unit is not only unstable in many different ways, but has turned this instability to account by a process of generational education which enables it to adapt itself to and profit by its environment in a way that was impossible in the individuals of lower grade.

It may be noted, furthermore, that the higher the individuality the more completely it may include all the lower in itself. Thus, the simplest molecule includes atoms; those of more complexity groups of atoms; the simplest organic form a host of complicated and simple molecules. The higher species have groupings into parts, which are often essentially distinct creatures though centred in a single person. The whole of an organic realm is a part of a celestial sphere, as that sphere is of a solar system, and that, in turn, of greater stellar associations. Such appears to be the order of individualities. They are distinct because they represent localized modes of action; they are absolutely blended with the whole because the whole is a unit; it may be termed "the supreme individual," which has all its relations within itself.

When the greater individual passes away the lesser individualities of which it was composed are parted from the association. When the molecule ceases to be the atoms persist; where the organic form perishes, its molecules or atoms, as the case may be, are free to set about new tasks. After all such destructions, even of the simplest individuals, there remains something that is not and can not be destroyed. This, if no more, is the work done during its life. As we have seen, every individual, from its very nature, is a place where the energy which comes to it from without—in effect, the influence of other beings—is transformed into new modes of action. This is generally true of all forms above the plane of the atom, and it may be true there also. As we rise in the scale of complexity the individuals become more and more potent in their effect on the world about them. When we attain to the grade of men we find the creature doing a vast work, the most of it far below or beyond the plane of consciousness, a fact that in nowise lessens the importance of what is done. In his body he has stored the experience in life of perhaps a hundred thousand species and incalculable separate ancestors. This he may send on as an organized whole, with such additions as his own life may make to the store. In his personal activities he starts inconceivably numerous trains of action that quickly lose their evident connection with his self, but are none the less of his own creation and are forever influential. If we could obtain an ultimate analysis of what is at work in the world about us, shaping the minds and the destinies of mankind, we would doubtless find there the deeds of all the vanished units of our race, each having a share, great or small, in the human activity of the present moment.

So far we have chosen to consider the organic individual in its most perfect aspect, that of apparently complete separation from the world about it; though, as we have seen, united to that world by an incessantly active and practically infinite number of exchanges, so that the isolation is in appearance, and not in reality. We have still further to correct this conception of individuality by noting that the greater number of the kinds act not alone but in assemblages of their species, and that their activities are more or less married to those of their kindred. Sometimes the union is bodily, sometimes mental, or it may be a combination of the two. But in all cases it results in a more or less complete blending of the creature with its kindred—a blending that may be so complete as to make it appear but an insignificant part of a whole association. This is most evident in certain of the lower invertebrates, as in the compound corals and the sponges, where the separate creatures are linked together so that they form a colony which has its individual life. In many other species this colonial order is likewise so perfect in the manner common in the plants that we look upon the association as the real individual. In the higher forms of life, where the intelligence becomes well developed, the sympathies link the individuals in the higher unit of the family, the tribe, or the state. This sympathetic union may go so far that the separated mates are likely to perish from the sorrow of parting. How far this mental union of the individual with his fellows has gone in mankind it is not necessary to set forth.

In the higher groups of animals where the person has become too important to have its life merged in a structural colony, such as a polyp community, it commonly proceeds to amplify itself by developing a host of minor individual parts, each of which becomes, in a way, a separate unit of the body. Thus, in the crinoids, the first of the animals of distinctly radiated structure to abandon the method of communal life so general in the group, and to attain a relatively high station as a solitary form, the initial step in the advancing series consists in the adoption of an external covering made up of very many distinct polygonal plates. Each of these has its separate centre of growth, and in its development manifests what we may term a sympathetic independence of the neighbouring plates. That is, each is as completely individualized as is consistent with the needs of its place in an organic whole and its relations to adjacent units of a like nature. Every one of the separate bits has a certain likeness to every other. The order of their architecture is the same, repeating the radiate symmetry so characteristic of the whole framework. The same tendency to allot the control of the body to subordinate individualities is to be observed in all the higher organisms. It may indeed be fairly asserted that all the great advances in the series of animals have been accomplished by this method of delegating functions to parts which become the seats of separate partially independent life.

The obvious likeness of those animals, such as the articulates and vertebrates, with their many individualized segments, each much resembling the other, to what we find in such communal forms as the compound polyp, where the association is made up of essentially independent creatures, has led to the conjecture that perhaps these higher forms were originally communities, as in the polyps, composed of separate individuals that were associated in a longitudinal order, as are the several rings in the worms, the once distinct creatures having become united. Although this view has, for good reasons, not been accepted by naturalists, it is in the face of the facts very plausible, and goes to show how general and effective is this curious tendency to establish individualities of a high order of independence within the larger body. While the particular form of these secondary individualities of the organic body may in part be due to natural selection, their invention, like all such origins, must be attributed to some more remote influence.

The facts which are briefly noted in the foregoing account of individualities justify the statement that along with the tendency to create separate centres of action goes the tendency to combine these units according to their kinds into larger associations, each having also their individual character. Of these, human societies are the highest that we know. They represent the extreme term of a vast series of endeavour, begun in the remote past and continued in ceaseless experiments, which appear to have determinedly led to the social structure of which we form a part, and into which we are forced by the control which is over us to cast our lives, finding in so doing the fullest satisfaction that a being can know. It is a wonderful history. It must be well read before we are in a position to pass judgment on the scheme of life and death.

It is in the nature of man that he should seem to himself commonplace. In his ordinary experience he is set forth to his consciousness as a fairly discerned assemblage of impressions, memories, and motives. Although little of these possessions is at any one moment in the field of view, it seems that the whole is well known to us, after the manner of the contents of our pockets or the furniture of the room we know best. It is indeed almost unthinkable that we have not always been much as we are now. It is past conception to the grown man that he was ever as a newborn babe, with no more individual quality than was sent with him over the bridge of the generations. It is quite out of our power to realize the fact that what we are is as a vast complex of all that has been before in the chain of beings through which our lives have been derived.

It would be most unfortunate for us if that faint illumination of a little part of our being which we term consciousness were a great light that shone back over the long procession: for the sight of the perspective would be confounding. It is clearly for the best that with his limited powers a man should see no more of himself than what he needs in order that his action may be fitly directed. Yet it is well to have some conception of what is the nature of this complex which man calls himself. Such knowledge can never in any considerable manner extend or qualify this strangely limited concept of personality. This, because it is primal and instinctive, will ever remain substantially what the ancient experience has made it. Still, the use of this knowledge may, in an indirect way, affect our state of mind by developing what may be termed a kind of supraconsciousness or upper plane of the selfhood, whence the individual may look down upon his more instinctive motives. In my own limited endeavours to attain this higher plane enough has been gained to show that the detachment by the new manner of regarding the self may be sufficiently developed to afford a certain addition to the store of personality—one that greatly enlarges its scope and adds much to the value of life. I therefore venture to offer certain suggestions as to the ways in which it is possible and profitable to consider ourselves in the light of our history.

Putting aside the more abstruse inquiries of the psychologist because of the difficulty of approaching this field without professional training, we find that there is enough that is patent to ordinary observation to break down the commonplace view of our nature that comes from the ordinary reiterated experience with ourselves. Thus we readily observe that a certain store of capacities, in fact, nearly all that mark man as an animal or denote him as a man, come to him over the generational bridge from the life that was before. All that the development of these ancestral qualities does for a man is to amplify that which is thus handed to him. We thus see, at the very outset, that there is an essential delusion in this conception of ourselves as independent. Going further into the matter, we note that the lower animals—particularly our nearer bodily kindred of the *Mammalia*, and the birds, which though physically more remote are spiritually near to ourselves—share with us in the greater part of the motives common to our kind. Love, hate, fear, curiosity—nearly all the emotions that are found in men are found in them in like association. If we acknowledge the relation by generations of these creatures to ourselves, it becomes plain that all these attributes of the higher life owe their likeness to the common store of experience which all have shared in their ancestral life.

The foregoing considerations as to the enchainment of all the individual intelligences of this earth may in some measure serve to correct our notion as to the separateness of our life. Yet it is open to those who hold the idea that the mind of man is essentially individual to claim that all we receive from our ancestors is a certain vacant potentiality which may or may not have its empty spaces filled by individual experience. To some of these people the inheritance that comes to us over the generational bridge appears as no more than a mere formula in which all the concrete that gives it definite value is derived from the personal life. That such is not the case should be evident on a mere inspection of the facts. We see the progeny of all creatures, from the simplest to those of our kind, breeding true as regards all ancient and well-established features. It is not possible to give any rational explanation of this without stating in some terms that what we behold is one continued life—a life that may improve or degrade as it goes on from station to station—which sinks in the germ to the essentially invisible, or expands almost infinitely in the adult form, but which is inseparably one. This judgment may be helpfully affirmed by considering what takes place in the simplest conditions of the reproductive process, as in the lower *Protozoa*.

In those animals where the increase is by the division of the body into equal or nearly equal parts, it is evident that the child is but the continuation of the parent, none of the parts or functions in any way passing into an invisible state in the generational process, every feature and attribute remaining perfectly unimpaired. Although the passage from this simplest state of reproduction to that in which the work is done by means of the egg is not completely to be traced, enough of it is known to warrant the opinion that no change in the essential principle of the process occurs in the transition. At every step in the advance toward the higher method of passing on the life, more and more the form and method of action of the bodily parts is packed away into the reproductive units, to be expanded by growth into functioning structures. Still, we have to believe that, save in this conversion of the discernible shape into the indiscernible, there is no difference of value between the reproduction by mere division and that which takes place through the method of the impregnated egg.

At first sight the transmission of anything like thought may seem to be essentially more difficult than that of structures alone. We have, however, to believe that the brain, which is the instrument of our thinking, is, to the utmost of our details, determined by inheritance; at least until the individual life has begun to shape it. And even when this independent personality has gone far to give his brain a peculiar stamp, the inherited features must greatly preponderate. Conceiving then that the production of thought depends upon the action of cells or other elements of the cerebrum, it does not appear to be improbable that they may, because of their shape or condition, afford the way to thought such as was the product of the ancestral forms on which they are moulded. It is not necessary to suppose that thought is a mere secretion of the brain cells in order to hold the view just above suggested. We need to do no more than recognise the fact that there is some immediate connection between the state of the mechanism and the thought that proceeds from it. Come whence the thought may, if its coming be in any way the result of the condition of the brain, a particular state of that organ, such as may be altogether due to ancestral influences, may, indeed must, be conceived as giving rise to a definite mental process.

Taking it to be a fair hypothesis that the shape of the brain, as determined by inheritance, may give rise to some kind of thought, the question arises whether we find in our experience any mental actions or products which can reasonably be referred to the antecedent life and regarded as due to ancestral experience. To approach this question with care we should first note that the kind of mental work that would come to us from the spontaneous action of the inherited parts, if such come at all, is by no means clear. Yet we might reasonably expect that any elements of thought which were thus introduced into our minds would appear in a detached and fragmentary form. We are led to this supposition by what we know of inherited instinct whenever we see the results of a process which is clearly in the same field as that in which suspected phenomena would lie. These emotional features come to us as rather vague impulses which in most cases need to be more or less compounded with personal experience in order that they may be efficient. Thus, in the emotion of fear, all that is derived from the life before our own is a feeling that is characteristically ill defined. It attains shape only when it is informed by the sensations and ideas that are of an immediate individual nature. It is perhaps as incomplete and fragmentary elements of thought that we should expect to find any contributions that depended for their existence on the action of the inherited features of our brains and not upon the stimulus derived from personal experience.

In seeking for any evidence of what we may term inherited or automatic thought, I have been led to observe a group of rather obscure phenomena which has received less attention than it appears to deserve. The facts to which I would call attention may be noted under the following conditions: If we carefully, and with a skill which is gained only by some training, slow down the normal activities of the mind, so as to clear it as far as possible of the ideas that the environment normally induces, we may, with close attention, note that from time to time, often in quick succession, there appear what for convenience we may term *seeds of thought*—most commonly in my individual experience these take the shape of visual images—rarely that of sounds, most rarely they are presented as a word. It is characteristic of these presentations that unless at once seized upon by the attention, and in some way linked to the more vigorous elements of the mind, they quickly fade away; so that in a very brief time, probably not more than a few seconds, they are not only gone, but can not be recalled by any effort of the memory. They are indeed most elusive, being in that regard, to my apprehension, distinctly different from the ordinary store of the mind which clearly rests on experience.

The way in which the above-noted seeds of thought enter the mind is in a measure peculiar. They appear to come in an entirely sporadic manner, and not to be connected in any way with the ordinary mental occupations of the observer. Thus, if in the moment before sleep, when the mind has become cleared of the burden of the day, we retain consciousness enough to watch what occurs, we may note these suggestions flashing like meteors out of the darkness, to remain bright but for an instant. If they happen to fall upon some material of ordinary experience they may, by combining with it, attain enough permanence to start a dream, but usually they disappear without even this slight result.

Where true sleeping dreams occur they sometimes afford what may be taken as clearer instances of spontaneous thought than those which are observable in the conscious state. Although with some people there appears to be a tendency in sleep for the mind to revert to the events of experience had during waking, it is normal for the suggestions which are shaped into dreams to be curiously apart from the ordinary events of life. In my own case, so far as I have been able to examine into the origin of dreams, few, if any of them, appear to be connected with the events of actual life. That is, the seed or centre of the thought is most apt to be foreign to all my waking experience or imaginings, having the same measure of novelty that belongs to the fancies of other people of which I have heard or read. It is true that much of the matter that gathers about the primary concept of the dream may be such as is recognisable as a part of the old store of experience of the mind; but the fundamental notion seems to be characterized by its strangeness.

It appears to be a characteristic of these spontaneous thoughts that they are in the nature of images, though they may be in the form of sounds, possibly of words. Those I have most clearly discerned are all visualized bits of facts, such as slight landscapes or groupings of people or animals; sometimes the form of a man; perhaps oftenest a human face. In no case are the suggestions, until they appear to be associated with personal experience, at all complicated. Such are the features which we would expect thoughts due to inheritance to exhibit. They would probably be simple, of an accent so slight that they would be readily overlaid by those due to the senses. They would, moreover, tend to abide outside of the field of consciousness, for the reason that their way of coming to the mind was essentially abnormal. These are, it is true, but conjectures; yet they are warranted by what we can note in the phenomena of the emotions which we have to accept as the results of inherited structure.

Some evidence in favour of the hypothesis that concrete thought may be inherited is afforded by the nature of the actions where the mind, for any reason, becomes so disordered that it is the prey to delusions. In this condition the control of the individual consciousness over the mental processes is lost, and, as in dreams, accidental suggestions of a kind that can hardly rest in experience may rule the mind. Thus, it has been remarked by alienists that pure-minded women, concerning whom it is impossible to believe that thought or action have laid the foundations of obscene thoughts, will when insane show by their speech that they are afflicted by indecent images. In general, it may be said that mad people appear to suffer from the vivid presentation of thoughts that are not their own by any legitimate personal right, but appear to come to them in some obscure manner, such as may be explained by the supposition that, owing to the loss of the control which the consciousness normally exercises, the spontaneous thoughts, as in sleep, gain a strength that sanity denies them.

It is evident that the suggestion that the physical mechanism of the brain of itself may produce thoughts which are not the product of personal experience, is in accord with the common empirical judgment which men of all ages and races have made as to the nature of insanity, which is in effect that the afflicted are possessed by ideas not truly their own, but suggested by some other personality —as by evil spirits. Without giving too much value to this ancient view as to the nature of insanity, it may fairly be held that the consensus of opinion, to the effect that the control of the madman is in some way beyond his true self, has some weight in the argument we are following. In all such popular opinions, however much of error there may be, there remains the verdict of the great jury which is apt, in some measure, to hold essential truth. In this matter the judgment is that we have to deal with two conditions of the individual. In one of these—the sane—actions are controlled by thought that rests upon experience, which is controlled by the body of such experiences that memory supplies;

in the other—the insane—the suggestions come from some source beyond the field whence they are commonly derived—much as they do in dreams. This general recognition of the essentially foreign nature of the suggestions that move those who are mad, so far as it goes, tends to support the idea that there is some other source of thought than that which personal experience affords.

It would be interesting to consider in more detail the relation of this hypothesis of spontaneous thought to the theory of the individual life. To do this would lead us too far from our main purpose. I shall therefore briefly sum up the matter as follows: What we perceive in the evident inheritance of the emotional side of the mind, and of instinctive actions, apparently indicates that the frame which we inherit can of itself produce a kind of mental product, which, though distinct from ordinary thoughts or visual images, is not widely parted from these higher products of the brain. What we observe as to the process of thought in peculiar conditions of the body—as in sleep, in insanity, or in the state of quiescence to which we can with care reduce our minds—appears to show that germs of thought not founded on individual experience are spontaneously produced. Further, that the universal judgment of men is to the effect that, in the insane state at least, actions may be controlled by such impersonal thought. Thus, while it can not be assumed that the hypothesis is verified, it may be said that it offers a fair solution of problems which do not otherwise seem to be explicable.

The question remains as to how far the hypothesis of spontaneously generated thought may affect our conception of individuality. To answer this we should at first note the point that, assuming the structure of the brain, as determined by inheritance, to generate or disclose thought independent of experience, it does not follow that such thought has its shape because of the specific ideas of our ancestors. It would be more likely that, while some relation to the ancestral thinking existed, the matter would be greatly altered in the transmission, so that the relation between the old and the new would be that of genus or species and not of identity. We may conceive it as analogous to the movements of our limbs. Each of these motions is due to inherited features, developed in our ancestors, of varied degree, by their actions; indeed, altogether shaped by them; but the acts are personal and not ancestral. It is also evident that, while spontaneous thought may possibly have a considerable share in affording material for the use of the constructive imagination, it has little relation to the conduct of an ordinary sane life. That life is, by the moderating effect of the balance wheel of consciousness, kept well within the control of real experience, so that while the control is effective, as it is in the waking life, the man is essentially individual. In that state his thought is effectively determined by its personal experience with the environment.

Whatever be the origin of the spontaneous thought which comes to us in a form to show that it is unrelated to immediate experience, it is clear that it is a possible source of intellectual values that are in this age much neglected. There is reason to believe that our systematic education, tending as it does to limit thinking to matters which are suggested by the exercised attention, tends to make men increasingly less sensitive to these automatic contributions to their minds. The most evident effect is to be found in the loss of the poetic faculty in those who have by long training become dependent on the senses for the stimulus of their imaginations. It seems to me probable that the main difference between practical and poetical minds of like general capacity lies in the use which they have become accustomed to make of the spontaneously offered germs of thought. My own experience serves to show that it is possible by attention to increase the share of thought that apparently arises independently of experience, and that it may be done even at an age when the habits of the mind are relatively fixed. This is, however, a large question—one that does not fairly concern that we have in hand.

CHAPTER V

THE PLACE OF ORGANIC LIFE IN THE UNIVERSE

Before we go further in the consideration of the facts relating to death, we should somewhat extend our view as to the place of life in the physical universe. Standing as we do in relation to organic phenomena, there is a certain danger that we may fail to estimate its proportion to the whole as it should be reckoned. The tendency is to look upon the material world as a mere corner stone to that we are pleased to call living nature. To correct this natural prejudice, let us glance at the place which the organic occupies in the whole realm—for our purpose the task may be briefly done.

Let us first note that all the organic life we know is made possible by the conditions of water at certain temperatures—i. e., between about 150° F. and the freezing point of the fluid, 32° F. Although some living forms in certain states, as that of spores, can for a time survive above the first-named temperature, it is doubtful if any but a very few can maintain life in such conditions. In fact, we may regard the vital range as essentially limited to not more than 100° F. Comparing this range with that of the heat in the earth and in the realms beyond, what do we find? The facts, so far as we have learned them, are as follows:

On the surface of the earth the extreme variations, except that of materials brought from below, is perhaps from 120° F. above to about 100° F. below the freezing point, so that life occupies about one half the range that is due to the earth's climatal conditions. In the depths of the earth there is evidently a very high temperature. We have no means of measuring it with accuracy, but it can not well be less than some tens of thousands of degrees. Calling it, say, 10,000° F., we conclude that life has a place in not more than one hundredth part of the limit of heat that the earth exhibits. In the sun the temperature is evidently very much higher than on the earth. It is a general belief among the students of solar physics that the heat there is to be reckoned as not less than 100,000° F. Thus measured on the temperatures of the solar system, the possible field of organic life occupies not more than the one thousandth part of the scale.

In terms of time the importance of organic life is likewise apparently insignificant. It could not have come into being until the earth had cooled down to a point where the seas were near the temperature at which we now find them, and until the heat of the sun had come to about its present state. This antecedent time included the ages during which the solar system was evolved from the nebulous form and brought into the present condition. We have no means of knowing how great this time was, but it certainly must have been vastly longer than all that has elapsed since life began to be. It was most likely of such duration that the organic period if set against it would appear a mere nothing. Beyond the present, probably far beyond even in the geologic sense, there is reason to believe that the heat of the sun will remain as it has held for many millions of years, to maintain animals and plants in existence; but inevitably the source of that life in the sun's heat must fail. Further than that end we can not see, save that there is no limit to duration. It is possible that after a time the solar system may, by collision with some other mass, be reconverted into disseminated matter again, to undergo the process by which it is rebuilt into sun and planets. Be this as it may, the fact is clear that the organic period of this world, or of any like conditioned sphere, is but a moment when measured against the time required in the processes of the suns.

Considering the proportion of the matter of the earth which is at any one time in the vitalized state, we find the proportionate value in like measure insignificant. If all the living forms of to-day were brought down upon the surface of the earth their bodies would form a layer of material which would probably not exceed a foot in thickness, or about one forty millionth of the earth's diameter—a mere film on the surface of the sphere—an infinitesimal part of that mass which can never feel the vital impulse. Small as this share is, it is vast as compared with the essentially lifeless masses of the solar system. The sun is of course excluded, as all such heated bodies necessarily are, from any opportunity to share in organic experience. The interior planets, Mercury and Venus, are so near the sun that their temperatures in the daytime must be far above the limit at which water can play its part in organic work, a part which is essential to the processes of life. Moreover, recent observations on these planets appear to indicate that they do not revolve on their axes after the manner of the earth, but hold one face toward the sun as the moon does to the earth. They have therefore to be excluded from the viable realm.

Of the outer planets the only one which can possibly be the seat of organic life is Mars. This sphere receives about one third less heat than the earth. Such a difference if brought to bear on our own orb would at once bring every part of its surface permanently below the freezing point. It is possible that Mars may have a deeper atmosphere, or one more effectively resistant to the radiation of heat, and so have its surface kept at a life-giving temperature. It is, however, doubtful if such be the case. The question is one of much difficulty, but in the opinion of those observers who have approached the problem without prejudice and with the highest professional skill, the probabilities are that Mars is without seas or any general water system, and that it is unsuited to such organic life as that of this earth. Therefore, so far as we can learn, the living beings of our solar system are limited to the earth. We can not well suppose that life has ever existed on any other of the planets except possibly Mars. It is, of course, possible, perhaps we may say very probable, that on the planets of other solar systems the organic complex may occur as it does on our own; but this, if true, in nowise diminishes its infinitesimal relation to the masses of matter which have never known and can never be lifted to the organic state.

To complete our view we should note the fact that the spatial relations of organic life are as limited as are all the others. From the bottom of the deepest seas to the highest points under the equator to which life can extend is about eight miles. When compared with the measurements of our solar system alone this is of no more than microscopic value. Thus, by all the material or visible standards that we can apply, organic life appears to be of the slightest conceivable value. It is but an atom in the mass of the solar system; it occupies but a moment in its duration; it has hardly a place in space; it is but a temporary film on one of the smaller planets. It can exist only in a very small part of the scale of temperatures through which the spheres pass from their first to their last state. Set against the visible universe it is as near to nothing as we can well conceive anything to be.

At first sight, indeed for some time after it is grasped, this conception of the place of the living in the visible universe is appalling. Reflection leads us, however, to a readjustment of our primitive conceptions as to this matter and to the correction of certain errors in them; when this is accomplished we find ourselves possessed of a larger understanding of the problem of existence. If this which we call the living were in any way essentially parted from the rest of the universe so that it had to be separately measured—if, indeed, the term being were more than relative—then our pain would be in a way justified. But, so far as we can see, this state we call life is no more than one of the summits of various series of actions which go on in the visible realm. It bears somewhat the same relation to the great mass of activities that the blossom of a plant does to the rest of its growth. A part of our regret at the exceeding limitation of life is clearly due to the sympathetic movement of our minds which leads to the feeling that it is a pity to have the pleasure of existence limited to so small a part of the realm. We may correct this by the thought that there may be endless other means of pleasure to us unknown. Because we, as the summit of one of the natural series, approve of the peculiar mode of existence to which it has attained, we have no right to conclude that we possess the only consciousness of good. The presumption, if there be any of value, is rather that our own success, because of its materially trifling nature, is really less important than others which are won in other modes of existence.

The view of the universe which centres all in man is very natural but very conceited. It undoubtedly has been in certain ways advantageous in the past. It has served in the primitive states of our intellectual development to give us a measure of confidence as to our place in the world which in the early ignorance of nature would otherwise have been denied. Now that we see further and more clearly, we are prepared to rearrange our views as to man's station in the realm. We see that it is other than it at first appeared. We can no longer conceive our kind of life as the sole important product of the great field; it appears as only a small part of the marvellous whole. Its peculiar dignity lies in the fact that it has led to the intellect of man, to a mode of looking upon the universe which, so far as we can see, is unique. Whatever other modes of accomplishing this work there may be we do not know; but be they immeasurable in number, it in no way diminishes the place we hold.

CHAPTER VI

THE GROWTH OF SYMPATHY

Our glance at the place of organic life in Nature has shown us that the essential feature of it is that in a peculiar and exceedingly rare state of matter individuals are developed which are capable of harvesting the effects of environment in experience, transmitting the profit thereof, first to the heirs of their bodies and later to those of their minds as well. In other words, we have entered on the field where individuals arise differing in character from all that has gone before, in that they are educable and in their succession provide for a far-ranging development of many themes unknown in the lower realms of being. We have now to trace in outline, limiting the inquiry to those features which suit our main purpose, the series of this on-going which lead to the estate of man.

At the outset of organic development, or at least in the lowest creatures which are known to us, we find the organic body in a very generalized state. These lowly individuals are hardly to be definitely classed either as plants or animals; they are living, and only at a later and higher stage do they become very clearly one or the other. Taking the most observable of them, the *Amœba*, we find that it contains in its bit of transparent, gelatinous body the essential motives and capacities of an organism in a very diffused state. It can move, feel, digest, and reproduce; all these functions being present, so far as we have learned, in every portion of its frame. It is fair to presume that they exist in the smallest bits into which it might be divided. It is, indeed, most likely that these properties inhere in the molecules of the protoplasm or other chemical foundation of the creature.

It is to be noted that what we perceive in the way of vital powers in these, the lowest forms of life known to us, are probably but a very small part of the store of capacities which they contain. The indication of this is to be found in the fact that similar translucent or even transparent jellylike creatures, such as make up the communities of the sponges, construct elaborate devices for the support of their united bodies in the form of elegantly shaped frameworks, which have a rare beauty of proportion and architectural finish; while others, such as the *Foraminifera,* inclose their bodies in cases which have an exceeding grace of form and proportion. We see here what we behold in the egg or seed of the higher organisms, that a vast store of experience, the lessons learned by innumerable generations, may be garnered in a substance which appears to be simple, and is evidently without any such complication of structure as we are accustomed to associate with elaborate organic work.

The point last noted concerning the apparent simplicity yet real complication of the lower organic bodies, and their equivalents in the germs of the higher species, deserves particular attention, as it may serve to correct an egregious error into which all of us, even the well-trained naturalists, are prone to fall. Francis Bacon, in his admirable account of the many idols or prejudices which men are apt to worship, failed to note this of pseudo-simplicity. Yet it is one of the most hindering of all those which beset the path of the inquirer. We see, for instance, that the air before our eyes is transparent; we can not, much as we know of its constitution, avoid the impression that it is perfectly simple, a kind of nothingness. Yet we know that it is a vast entanglement of materials, actions, and adjustments —a complex which learning will surely never completely solve. So it is with all the regions whereunto our sight penetrates: we feel that we see completely, though every step of our inquiry tells us that we do not really do so.

It is well at this place to force on our attention the fact that the capacity of the organic body to gather into an inconceivably small quantity of matter a practically infinite store of inheritances is apparently unlimited. Into the unweighably minute germ which originates a creature there is laid away a body of traditions which, when unfolded by growth, exhibits the result of the experience of all the generations, perhaps hundreds of millions in number, that have gone before. This education in the art of handing on the results of the previous life is the first and most fundamental accomplishment of the organic realm, for on it depend all the other gains that have been made.

The ability to transmit the qualities of the body to the successor is one that may possibly have become in the course of time the subject of natural selection, and been thus modified and affirmed in the measure in which we now find it. It is, however, not at all likely that it could have been instituted in this manner at first. It is most reasonable to suppose that it is a primal characteristic or motive of the organic body which has been developed by the survival of the fittest. It is evident that those species which most effectively propagated and which tended to hand down their gains to their descendants would have an advantage in the struggle for existence. The profit thus attained would be won on certain lines of evolution the nature of which we readily discern. In the young of plants and animals alike the means whereby the creatures may obtain food is a matter of foremost importance; next to that, the provisions for avoiding danger. These needs are of fundamental importance for the reason that they are essential to the life of the individual. After them comes the means of reproduction, relating not only to the mere increase in numbers, but to the provision for the care of the offspring. These essentials of organic forms are common to all kinds. They are the product of the evident relations to environment of the two great kingdoms of plants and animals into which living beings above the lowest are distinctly divided. It is characteristic of the plant realm that it attains in no case to intelligence. In every other important physiological regard the individuals contained within it are like those of the higher animal series.

The fact that the animal series turns toward intelligence, though at first that turning is very indistinct, is of great importance in determining the shapes of their bodies. The needs of a frame which is to be the habitation of an intelligence and under the control of a will are quite other than those which may serve the more limited functions of an unintelligent creature, such as a plant. In the animal we normally find that the main lines of its structure mark the adaptation of its parts to the necessities of the mind. The lower forms, such as the *Protozoa* and the sponges, do not exhibit this accommodation to the requirements of the mental parts, but, as we rise in the scale, the adaptation of the body for this purpose becomes more and more evident.

A general need of the animal form, except those grouped in organic communities, is that it shall be free to move. This is in marked contrast with the plants where fixity is advantageous. The difference in part arises from the essential difference in the source of food. The plant can obtain its nutriment directly from the mineral kingdom, from the soluble, earthy matter in the soil, or from the waters of the sea; therefore for it the fixed station is advantageous. The animals, on the other hand, are denied all direct access to the mineral world. They have to feed on plants or on other animals who, directly or indirectly, have obtained their organic matter from vegetation. Hence solitary animals usually have to be mobile in order that they may seek their subsistence. It is, it may be remarked, quite possible that the parting of the two great streams of life, that which has flowed on to the higher plants and that which has led to man, may have been due to the simple fact that certain of the primitive forms found their way to the habit of feeding on the products of the lowlier life and lost that of depending on the inorganic sources of subsistence. As soon as this habit of what we may term secondary feeding was established, motion became, as we see, a very desirable feature.

It is perhaps well to call attention to the fact that there are very many species of animals in the lower parts of the invertebrate groups which have a habit of body as fixed as that of the plants. All these creatures are so placed as regards the currents of the water in which they live that their food is brought to them by the motion of the fluid. The greater number of these sedentary species have developed a method of uniting their bodies, as in the polyps, so that many individuals form one organic community. It is noteworthy that in all these attached forms, single or compound, we have a tendency to shapes which distinctly recall those of plants. To the earlier naturalists many of them appeared so like plants that they were given the name of zoophytes, to indicate that their relations were with both the plant and animal kingdoms.

As the movements of animals of the lowest types are unguided by any clear perceptions, they have no definite direction. In the *Amœba*, and generally in the *Protozoa*, there appears to be no distinct trace of a definite will. The direction of motion is determined by the side from which the stimulus leading to it may come. But as sense organs are acquired and means of locomotion are perfected, the body rapidly develops an axis of motion. The mechanical conditions require that whatever organs of propulsion there may be shall be arranged on either side of the axis; that the head, with the anterior extremity of the alimentary canal, be placed at the anterior end of this axis; and that there be a definite lower and upper side to the structure. We are so accustomed to take our impression of what constitutes an animal from our experience with our own bodies and with those of the higher forms of the vertebrates, that we accept those features as matters of course. It is difficult to conceive how slowly, by age-long struggles, they have been developed. In certain groups, as in the radiated animals, where the body, as in the starfish and the sea urchin, is made up of similar sets of parts, arranged as in a plant about a vertical axis, the creatures evidently strive to twist the body into a shape which will permit the development of an axis of motion so that they may adopt a definite direction of movement, thereby securing some of the advantages which the more fortunately conditioned types enjoy.

As the animal body advances from its lower estates its gain is marked and in good measure effected by the progressive allotment of the several kinds of work to particular parts, each contrived for a special duty. The result of this is a number of systems, organs, and limbs which do no more kinds of work than before, though they do the tasks more perfectly than was done in the body of the *Amœba*. Of these systematic divisions of the frame the most important, for it is the key to the growth of all the rest, is the nervous system. As this part slowly becomes developed it affords with each advance a better opportunity for the creatures to act in reference to the stimulus of their environment. As the sense organs, those of sight and hearing, become more and more specialized, the co-operating intelligence, at first a slight reflex action which hardly deserves the name, rises in its grade until we see that there is a definite will which expresses itself in purposeful action. At this stage in the development the animal is no longer a mere passive recipient of what the environment may send; it goes forth to its surroundings. It enters on the wide field of wilful activities. It becomes in a fuller sense alive. We shall not undertake to trace even in the merest outline the far-ranging, the practically infinite experiments and devices which are made to improve the qualities of the animal body which serve to fit it to be the suitable habitation for an intelligence. To tell the story in the briefest manner would be a great task, one for which full knowledge is not yet at hand. It is, however, necessary for us to consider certain peculiar features of this development which have led to the creation of the most important qualities of the vertebrate, and especially the human mind, as compared with that of the lower invertebrate forms.

First, let us observe that in all the animals below the vertebrate—i. e., the backboned type—there is but one nervous system, which has to do all the work of receiving information from the environment as well as that which is connected with the internal economy of the creature. In this condition the actions of the animal appear to be guided by a kind of habit which we term instinct—an intellectual process concerning which much has been written, but little is really known. This primitive nervous system of the invertebrates is probably the equivalent, perhaps the predecessor, of the great sympathetic system in the vertebrates—that which controls the actions of the several organs and in large measure acts as a bureau of internal affairs. It may be, in part, the seat of the emotions, but it clearly has no share in the intellectual life. When we come to the vertebrates we find a striking innovation in this part of the body in that a new nervous tract is developed, that of the spinal cord, and in time its enlarged anterior part, the brain. As a consequence of this addition we have a better chance for the development of the intellectual life. The brain and spinal cord, though they have much to do with the control of the body, sharing that task with the great sympathetic system, are mainly concerned with sensations derived from the environment and actions that relate thereto. The brain being in close connection with the organs of sense becomes the seat of the rational powers, while the spinal cord is allotted, in large part, to the reflex or automatic actions which relate to the sensations. The most important result of these additions is the brain, for on it rests all the possibilities of higher development which have been elaborated in the vertebrate series. The creation of this part gave the body what may be termed a third nervous system, for it is nearly as distinct in character and functions from the spinal cord as that is from the great sympathetic combination of ganglia and nerves. It is this exceeding gain in the apparatus of sensation, action, and intelligence which sets the backboned animals so apart from the lower types of the animal kingdom rather than the mere possession of an internal bony skeleton. The essential characteristic of the group is that it has a far greater provision for intellectual work in relation to environment than any of the lower forms of life.

Along with the ample development of the internal mechanism of intelligence which characterizes the vertebrates, we find a curious and important limitation in the machinery by which the behests of the rational will can be executed. In the higher articulates—the crabs, lobsters, and especially the insects—we note that the plan on which the body is built provides a great array of limbs and other parts which are readily shaped so that they may do whatever the will demands in the way of service. As is well known, these creatures are made up of many similar sets of parts, arranged in a train along the longitudinal axis. Each of these segments has usually one or more pairs of limblike appendages which can be turned to varied uses. The evident advantages of these structures is increased by the fact that the skeleton of the animal is essentially external, while that of the vertebrate is internal.

The result is that the limbs of the articulates are covered by a hard coating which can be modified to make jaws, paddles, legs, stings, feelers, or whatever else is required in the way of tools to serve the needs of the will.

Out of the system of the external skeleton as we see it in the insects there comes an admirable success in varied action. The nervous processes are so directed that they have but to set the mechanical appliances to work in order to attain the profitable end. The result is that while the will which guides the actions of the insects and other mechanically perfect invertebrates may, and indeed generally does, attain a high order of development, the rational quality is hardly to be found there. The reader may understand this matter the better if he will consider what effect working with a tool exactly suited to the need has on his mental action. Let us take an example such as is afforded by the instruments of habitual action: the pen, the bat, the oar, or the foil. Let us suppose a novice in fencing to set about the acquisition of that manual art. His first acts have to be guided by rationally determined movements. He must cognize and control in a thoughtful way all that he does; but as with practice he gains mastery, a kind of instinctive intelligence takes the place of the mental action so that he makes his movements with no consciousness of them, or at most he knows what he has done after the doing of it. In fact, he is not a master of his art until his acts are what we may term automatic.

Let us fancy that all the necessary actions of our body, those concerned with the environment as well as those of the internal economy, were so related to inherited structures that all the work of the will should be done in the manner of the skilled fencer; that the tools of every trade were, as with the insects, bodily parts, and that with them came an inherited capacity for their use such as guides the infant's lips when it is placed at the mother's breasts; we clearly see that while the will would remain active and perhaps in its exercises give pleasure, such as we receive from the automatic activity of our sports, there would be no necessary culture of the higher intellectual faculties from that activity. Men would with such exercise become instinctive creatures, as they in a measure do in certain occupations where the will operates without conscious thought connected. It fortunately happens that in such routine men think of other things than their tasks, while they are guided in them by a kind of muscular memory. But if all their actions had been of the insect type, they would probably not be above these creatures in their mental condition. They, too, would work instinctively. Let us consider what has served to set the vertebrates on the plane of higher rational action.

We have noted that the articulate skeleton is, in effect, external, and that by affording varied appendages in large number it offers to selective action a great array of instruments which can be turned to any required use. It is otherwise with the vertebrates; in their skeletal system the framework began as the support and guard of the new-made spinal cord, as a long beam in the central part of the body, extending from the head to the tail. Early in its history this beam became jointed; on the outside of the body two pairs, and no more, of limbs were developed which at first appeared as fins with bony supports. In the course of events these limbs and their internal parts became more or less attached to the spinal column, so that they obtained a firm support; they developed externally with bones inside the muscles, and not with the hard parts outside of them, as in the articulates. At the end of each limb in the higher forms there were at first a number of digits—i. e., fingers and toes—the number quickly becoming established normally at five. These, like the other bones of the limb, were jointed so that a certain—at first limited—amount of movement of one joint or the other was possible. At the end of each digit a nail was left as the last monument of the ancient scaly covering. In addition to the four limbs the vertebrate was, by the processes of its development, provided with jaws, and in the mammals with lips, so that the head could grasp objects, and when it became well jointed by means of a flexible neck, it afforded a fifth functionally limblike structure. To this small array of instruments of the will there should be added certain occasionally specialized teeth, such as the tusks of the elephant and the horns which occur in certain species of vertebrates, as also the tail which occasionally becomes the instrument of the will, serving as in the fishes for swimming or, in other higher forms, for various subordinated uses.

Comparing as best we can the mechanical processes for the activities of the backboned animals with those of the articulate animals, we find that in number they may in general be rated as one in the higher to about ten in the lower forms. As regards their efficiency, the difference is yet greater; the appendages in the insects are uniformly far more especially adapted to the needs they are shaped to serve than are those of the vertebrates. In this last-named series the limbs, except in a few cases, such as the wings of bats and birds, are not greatly specialized for their particular uses as are those of the higher invertebrates, where there is need of highly mechanical action. If we compare a man and a bee, forms which may be taken as types of very specialized work in the two great series, we find in the lesser creature that the structure is exceedingly well adapted to the varied work it has to do. The wings are most effective instruments for rapid and well-directed movement. There are three pairs of well-jointed, nimble legs, antennæ provided with a very delicate sense of touch, mandibles of remarkably effective nature, and a sting which is an admirable instrument of attack. In the greater animal there is but one pair of instruments of progression, the legs, which give but little speed, the other pair of limbs being devoted to the special uses of the will. For the execution of his intellectual purposes the arms and hands are, except when they are provided with artificial tools, of little service save in climbing, for which purpose they have been somewhat specially modified. As for the hand itself it is, when unarmed, a very feeble instrument. It can not strike a blow to be compared with the sting of a bee in effectiveness, size being taken into account. Much has been said in praise of the structure of the hand, but it is in itself of little value for any particular organic purpose except in cleaning the body, until the creature it serves came to the state where it began to use at first sticks and stones, and later the more elaborate utensils of the various arts. Then it came to serve, as no other appendage does, as a universal tool-holder, essentially like the chucks of lathes which are so arranged that they may clutch any form of cutting instrument and guide it in its work.

However far we might extend the comparison of the articulate and vertebrate types of animals, we should only re-enforce the statement that the later and higher group of vertebrates is very inferior to the lower invertebrates in the range and scope of the parts which serve the purposes of the will. Not only are the serviceable appendages much fewer, but they are relatively inferior in capacity to meet particular needs. As an instance of that, we may note the limited extent to which the hand has varied in all the vast time since it took its existing general form in the lower *Mammalia.* The greatest change which has come to the extremities of land vertebrates has consisted in the reduction in the number of digits from the primitive number of five to two in the cloven-footed forms, or to one in those with the solid hoof; and in the specialization of the anterior pair of limbs for flight, as in the birds and bats. All this shows us that the conditions of an internal skeleton are such as to limit the number of limbs and to restrict their variations. The deep-lying, bony framework is not readily influenced by any needs. It, in common with the other internal parts, varies but little, and the variations that occur offer no such profitable features to selection as the accidents of the hard external skeleton of the insects and other articulates afford. Thus it comes about that while the vertebrates are provided with a very much better nervous apparatus for the use of the will and the other qualities of the intelligence, they are curiously limited in the means for reacting on the environment.

The general effect of the above-noted limitation in the instruments of the will that are provided for the service of the vertebrate body is to institute another and higher type of mental activity than that found in the lower invertebrate field. As we have already noted, the instinctive nature of the articulate mind—the state in which the acts done in response to nervous stimulation are performed by particular instruments in a way which has been termed "automatic." It is evident that such instinctive action is greatly favoured by the perfect adaptation of the appendages to particular needs. It is admirably otherwise in the vertebrates, because with a better nervous basis for the working of the mind they have to accomplish the behests of the will with inferior means. The result is that they are forced into rational rather than into instinctive methods of action. The use of the reason is fostered by the limitations set upon all their endeavours, so that gradually the intelligence enters on the slow ascent toward the rational quality we have in man. In other words, out of this apparently unhappy limitation of the appendages in the backboned animals comes, in the end, that quality of mind which, even more than their eminent peculiarities of structure, separates them from the lower invertebrate life.

It must not be supposed that the passage from the ancient instinctive type of mind to that of rational quality which we find in man was suddenly effected; in fact, the lower species of vertebrates appear in this respect at first sight to present no distinct difference in quality as compared with the insects. The popular notion is that both these groups of minds work in the same way; but no observer is likely to give attention to the comparative psychology of vertebrates and articulates without noting in all the members of the two groups certain essential differences in action which denote a clear demarcation between their mental processes. In the lower forms all action runs in grooves; it is unvaried to a degree which is rarely or never found among the vertebrates. An insect's will leads it to repeat the same movements under similar conditions with mechanical reiteration. They appear to learn little or nothing from individual experience; while the vertebrate of even the lower classes on close study usually shows that the lesson of the conditions is in some measure read.

The mechanical modes of action of the articulate may be in some part due to the very large amount of energy, in proportion to their weight, which their nervous system supplies. The more vigorous insects have a muscular power many times as great, in proportion to their bulk or weight, as the strongest vertebrates can apply. This power is likely to force the development of the insistent, unreasoning will, which is the conspicuous feature in the activities of the group. A part of the difference in the quality of mind of the two groups may be due to the fact that vertebrates have, on the whole, better organs of sense, in so far as their eyes and ears evidently afford them a broader foundation for knowledge as to the world about them. Their eyes doubtless see better than those of insects, for those of the articulates generally form more definite images of objects at a distance. It is not well known what is the range of insect vision or just how far it yields impressions like those we receive. But their vision is evidently very limited as compared with that of the true lens eye. So, too, with hearing, though perhaps in a less degree. The vertebrate catches sounds that are farther away and probably of a wider range in scale; insects attend to few noises of any kind. It is doubtful if their hearing is much better than their sight. The only senses in which they apparently exceed the vertebrate are those of touch and of smell. Those species which possess long antennæ appear generally to be able to determine in a very quick manner the difference between objects, even where the discrimination appears difficult, by a few passes of these sensitive feelers. In this way an ant seems to find whether another of his species is a member of his colony or no. It is in the sense of smell that we find the most evident advantage of the insects over the vertebrates. Thus, a female of *Ocneria dispar*, or gipsy moth, will, by some odour insensible to us, attract males of the species from a distance of about a mile away.

For our main purpose these differences between the highest of the invertebrates and the species of the backboned group are important, for they show us something of the basis on which the higher grade of animal life is founded—the life which deals with the world, not in the direct reflex way, but by the rational method by bringing experiences into critical accord. This process which has led to the intellect of man was evidently begun in the lower stages of the vertebrate type, and has slowly accumulated its possibilities until at length they took shape in the intelligence of men. Moreover, this quality of mind which has developed in the vertebrate has favoured the fullest development of the motives of sympathy—those motives which have been the most important of all in bringing about the evils and benefits due to death.

In the mechanical or instinctive method of the mind which we note in the invertebrates, we find innumerable marks of sympathetic action of a low grade, for a host of these species show varied methods of co-operative work. In those which form colonies, after the manner of the ants and bees, the individuals of the society will protect one another, or at least they will assail the intruder; but of any feeling for the suffering of the fellow-being there is no distinct evidence. There are, it is true, many recorded instances where ants have striven to pull out a comrade who had become entangled in some sticky substance, but it is not clear that this behaviour can be accounted for by any sense of sympathy with the sufferer. While there may be some trace of this motive in the lower realm of life, it is tolerably clear that it does not take on any definite form or play any distinct part in the activities of the creatures below the level of the vertebrates.

In the lower vertebrates we find little other mark of the sympathetic motives than is shown by the care of the offspring and the existence in many species of the herding habit. Still, even among the fishes and reptiles we observe that individuals may be domesticated, or, at least, wonted to contact with a particular person, which is an advance on anything we find among the insects except possibly in the case of the bees, where the members of a hive may become in a measure accustomed to their keeper. It is when we attain to the level of the birds that we first discover distinct evidence of the sympathetic motive. In these creatures the impulse is prevailingly strong, stronger perhaps than in any other, save in man. It is shown, not only in a general way, by the keen interest which they take in the doings of their fellows, in their wide range of sympathetic cries which express the emotion in terms that appeal to our own, but by a host of well-observed instances of the deep and abiding affection existing between sexual mates. As is well known, some of the species are monogamic to a degree unknown in any other animals, not excepting our own kind.

Among the birds, as elsewhere, the enlarged sympathetic motive has its origin in the family, which, in turn, rests on the nesting and incubating habits and on the extended care of the brood after it is hatched. The birds have invented a novel means of giving their young a measure of help beyond that which is afforded by a large store of nutriment lodged in the egg. Their feathers and the high temperature of their blood together make it possible, by the application of the body of the parent to the eggs, at once to hasten their development and to spare for other uses a considerable amount of the food stored in the shells which would otherwise be expended in keeping up the heat of the embryo. The importance of this last-noted aid has been overlooked, but it is noteworthy.

The work of nest building, commonly a joint task of both parents where the nest is a considerable structure; the service of the male in defending the nest, and his often associated labour in feeding the young; the care of the brood before it is ready for independent life—all serve admirably well to awaken an interest in the comrades of the flock or even of the fellows of the species. Probably to these conditions is due the high measure of sympathetic development which has taken place in this group. There, even more than in the mammals below man, do we find the individuals keenly sensitive to the sufferings of their kind; ready with warning notes to announce danger; willing in cases to meet it in order to protect their associates from peril.

It is interesting to observe that the development of the sympathetic motive beyond the mere traces of it which appear in the fishes and reptiles, and perhaps in the amphibians, occurs in the group where we first find an extended use of the will. Many of the lower vertebrates have vocal calls, apparently, in all cases, of an essentially sexual nature. Among the birds these sounds take in a wide range, only a few of them being connected with the sexual motive. Thus, among our cocks and hens there are a score or more of distinct notes or vocal signs which relate to their social intercourse. Other species appear to be even richer in these denotents of sympathetic states of mind. No such wide range of expression exists among the mammals until we attain to near the summit of the series where, in the apes, that range is large—yet hardly as great as among the birds.

The mammalian series shows us much the same process in the evolution of the sympathies that we find in the birds. In the mammals, however, there is lacking the conditions of the nest which make the family of the birds a most effective basis for sympathetic culture. Although some of the suck-giving animals are in a way solitary, all, save a few of the species, have either the habit of herding or that of the permanent family. Even the great beasts of prey, which have to range over a large area for their subsistence, usually have mates and young to which they day by day return. Thus, nearly as much as the birds, the mammals have the habit of association. They display that need of contact with the fellows of their species which is a mark of the higher life.

The birds and mammals alike exhibit, though in diverse measures, a token of sympathy which is peculiar to the higher vertebrates. They both are distinctly sportive, given to gambols which are clearly like those which we see in children and which are organized in the dance. These antics of the mammals and birds are almost always social performances. They apparently indicate that the creature recognises the companionship of its kindred and has them in mind in its enjoyment. Nothing of this nature is visible in the lower realms of life. We find there abundant evidence of the recognition of the fellow-member of the colony or the species in the sexual relations, in mutual labour or in combats, but of sportive gambols, in the form so general if not universal in the higher vertebrates, we discern nothing.

As is the case with all the other motives of the higher sort, that of sympathy, though exhibited in the lower grades of life, commonly undergoes a rapid development when we attain to the grade of man. It is true that in the lowest savages the range and the strength of the sympathetic movements are not clearly greater than they are among many of the birds and some of the higher mammals. But among men, even of the lowest estate, the existence of ordered speech, which enables them to go much further in the work of transmitting ideas than is possible when the communication is limited to mere cries, makes a vast provision for the development of associated understandings and of the sympathy that goes therewith. While the expression of this motive is limited to sounds conveying only general ideas, such as those of fear, joy, or satisfaction, though the sense of companionship is fostered, there is small chance that it will result in effective mutual help. Speech, even in its lowest forms, enables the creature to present itself to its kindred in a way that is likely not only to assure the sympathies but to give direction to their action. We observe a familiar instance of this in the growth of a child. In its infancy it has no resource wherewith to seek aid except its wail. This is very moving to the emotions of the hearers, but tells little save the distress of the sufferer. When speech is gained the creature is in a very much better position to command the effective aid of its elders. Thus, while language may not directly, or at least immediately, add much to the strength of the sympathetic motive, it greatly increases the effective value of this bond of union between the members of any society.

When, with the help of speech, the ancient sympathetic emotions begin their higher development in man, we find almost at once a great extension made in the basis of the mutual understandings and sympathies. The lower forms base their affection for one another on the attachment of parent and child, or on the habits of the herd which recognises all of the association as fellows and may yield obedience to a leader. Very early in human society there arose other interests to extend the range of sympathy. The religious motive is among the first and most distinctively human of these new developments. It affords a peculiar bond, one of very great power, as it brings the ancient and deeply founded instinct of fear into action and unites it with other movements of the mind, so that the result is a keener sense of comradeship.

Along with religion we may class organized war as an aid to the excitement of sympathy. There was, of course, unending fighting among the lower animals, but little trace of common understanding or of fellowship in their deeds. With man this exercise becomes, by means of speech, so far ordered that there is a sense of associated endeavour in such actions. Among the primitive peoples this sense of mutual work in war was undoubtedly a potent agent in bringing men to a strong sense of kinship. Its value was of the lowest grade in the series in which it belongs, for, while it developed affection for the fellows of the host, it tended then, as now, to limit the range of sympathies. Like many another feature of the primitive estate of man—as, for instance, slavery—it had its time, has served its purpose as a part of the scaffolding used in the construction of society, and now is fitted to pass away.

The possession and the sense of property, both essentially features of human society, have in certain ways been very effective in promoting the development of sympathy, though, like war, it has had at the same time a limiting effect on the range of the emotion. The first effect of the property sense is, of course, hedonistic, purely selfish; but, more than any other influence, it has in a secondary way served to create a sense of the rights of others, to make men put themselves in the place of the neighbour. The very corner stone of human society is an understanding of the privileges of the fellow-creature. It is clear that this sense has come forth from the earliest of them—i. e., the right of each man to his own possessions. In such ways as these the conception of the kindred man, as like one's self, has been greatly fostered by the development of social institutions. It may be truly said that these institutions have themselves been made possible by sympathy, for they were founded on so much of it as came to man from his lower kindred. But it is, nevertheless, certain that they have been potent agencies in extending and strengthening the bond which unites the individuals of a society in one whole.

It is hardly too much to say that the rationalizing of the sympathies which has insensibly come about among men has given those motives a different path of advance from that found in the lower stages of their development. Among the brutes they could be no more than emotions; while they may remain in this primal state among men, the obvious tendency is for them to be informed by the intelligence and to rise to higher planes of motive and action. In fact, the culture of the individual man, or that of the society of which he forms a part, may fairly be measured by the extent to which this process has gone on. So far as the ancient motives of affection for the mate, the offspring, and the kind have qualified, and have been qualified by the understanding, the life, whether individual or social, is lifted in the scale of being.

It is a peculiar quality of the sympathy with a fellow-being that it goes directly counter to self-interest. From the point of view of individual profit, hedonism is the fit state for a creature. It should get every advantage for itself and exterminate every other being which interferes with its immediate interests. So far as sympathy demands a share of nervous energy, even in mere feeling it is personally unprofitable. If it leads to acts of self-sacrifice it goes directly against the principle of the survival of the fittest. There is no doubt that the care of offspring aids in the maintenance and extension of kind, and that the willingness to fight for the tribe helps the chances of all its members, and so may be profitable to the gens and the species. But where the sympathetic motive, as in the higher-natured men, goes forth to all the life about it, we can not explain the extension by selective processes. It is in the immediate sense quite unprofitable; it takes from the giver and can not be imagined as helping the species or the race in a sufficient measure to add to its chances of dominance. But the process of expansion of the sympathies has gone on apace among men. To the inherited interest in the kind there was at first added an interest in the unseen realm. This at the beginning of religion was little more than fear, but as the plane of the thought rose it became truly sympathetic, until in the higher minds the love of the good alone is even as strong as that for the child or the mate. In yet more advanced stages of this wonderful development the affections extend beyond the original limitations of the state or race to include all mankind, and yet further to all living beings. In the highest spirits who attain to the ideal goal of this advance the emotion goes forth to the wider realm of Nature, all things having a place in the garner of the enlarged sympathetic intelligence, for in them the spirit of love informs all their thoughts and is awakened by all their perceptions.

The reader has doubtless noticed that no attempt has been made to show what is the effect of the long course of events, which has led to the union of the sympathies and the intelligence, on the problem of death. The meaning of the lesson is most likely plain to him; it may be briefly told. The first and most immediately important influence of the sympathetic motive is to do for the mental life what the egg, the lacteal system, and the placenta have, in a measure, done for the physical, by uniting all the members of a society in such a manner that the isolation of the individual is, to a great extent, overcome. This is, in part, accomplished by the helpful relations that grow out of sympathy, by the sense that everywhere about us there are others like ourselves who feel for and with us. There is an evident distress which makes most isolated animals miserable when they are without contact with their kind. This sense of loneliness is keener in the more sensitive man than in his lower kindred. In part, the gain afforded by social sympathy is due to the actual help, vast in amount, which every member of a human society lends to his fellows. At every turn it assuages the evils of his separate estate: helping in his coming into the world, helping in the stage of activity, guarding in the decline and consoling in the final passage.

Great as are the blessings of sympathy in the direct aid it gives in mitigating the recurrent ills of the individual, in its time of activity, and in that of death which parts it from its mates, they are of small account in comparison with the secondary influences that it brings to bear on the conduct of the mind it controls. By going forth to others with all his strength the individual wins beyond himself. He escapes from the prison which the sense of self inevitably puts him into. Just so far as he sympathetically goes forth to other personalities, to his fellows of whatsoever estate, to his God or to the Nature about him, he is emancipated from selfhood. Above all, from the fear of death that dogs the steps of all those who live within themselves. If a man could but remain thus abroad from himself he would go from life in the true euthanasia, parted from himself before the separating stroke came.

In the ideals of men, even among those of a primitive kind, we find that this understanding of the value of the sympathetic emotions has been well appreciated though its meaning has not been well conceived. To take the lowest manifestation of the understanding, that which is embodied in the death of the faithful soldier. He is always pictured as parting from life willingly, even joyfully, because of his love of his people or of his cause. Undoubtedly the self-devotion born of such sympathy affords a cure for the worst sufferings that death brings, and it awakens the beholders to a sense of what self-sacrifice may do to elevate a man. Again, when the sympathetic motive is religious it may, even more effectively than the simpler heroic motive, separate the man from himself so that torture unto death is unable to cow the spirit.

Although the conspicuous instances of the strength of the sympathetic emotions in taking men out of themselves are to be seen in heroic deaths, it is not in such events that their highest value is really to be found. It is in the paths of quiet duty in well-ordered and placid societies that the sympathetic sacrifices play the largest part in the alleviation of the burdens which life brings to men. All real social advance consists of gain in the altruistic motive. The advance might be measured, if there were a gauge, by the extent to which men dwell beyond themselves.

The foregoing considerations have made it plain that the steadfast tendency of the advance in the organic series is toward a union of individual lives in such a manner that the gulf of death between the generations may be, if not healed, at least so bridged that the succeeding generation takes on a goodly share of the profit that the preceding one has won from its experience. The last and highest of these devices is that of human society. We have no need to describe this institution. Some of its effects on the problem of death have been already noted. It is well, however, to consider the matter more closely. Experiments of the social order began in the lower realms of life. Nearly all animals which have any considerable measure of intelligence are accustomed to dwell together. They need social contact for their satisfaction, often for their very existence. The greater number of species which are well known show some trace of an order in their packs, herds, and flocks. In certain of them, as in the class of insects, the organization of a society attains a remarkable, though rigid perfection. In the ant colony we have an establishment which may endure for ages, each creature giving his mite to the activity of the state of which he is a part. In its formal way, measured by the stability of the organization, these ant colonies surpass any results which have been attained by men, for they may, so perfect is the balance of their order, last for geologic periods. They have, however, the peculiar mechanical or automatic quality that belongs to all the operations of the insect mind.

Human societies depend on the combination of the sympathies and the deliberately contriving intelligence which may have been attained by the vertebrates alone. From a certain point of view, which commands but a small part of the field, they appear to be the result of the hedonistic motives. So our descriptions of the social order, which have unhappily coloured the conception of it, commonly take account only of what goes on under the control of the impulses which lead men to seek to acquire wealth. While this seeking is one of the most ardent features in the social activities, it is a mistake to suppose that the gainful motives are those which are most effective in shaping the aggregates of man. If we could analyze the impulses which lead them to the unending toil and care involved in the pursuit of wealth, we should most likely find that the purely selfish were much the less part of the whole. Very little of the vast aggregate of labour in our industrial societies has for its aim the gratification of the purely individual desires of the workers. The greater part of the gainful impulse arises from the nobler motive of providing for the present and future needs and comforts of others who may be dependent on the labour. Much of it comes from a desire to win a favourable opinion from others. In fact, a society such as our own exists because its members are in large measure unselfish, because the outgoing of the sympathies has already brought men far into the realm of self-devotion, has released them in part from the ancient evils of isolated individuality.

Thus, although one effect of the higher sensitive life of our civilization has been to enhance the woe of death by making existence the richer and men more keenly sensible of its charms, there is a contrasted and counterbalancing influence in the extension of the spirit of self-devotion which leads them not alone to forget themselves and their fate, but to merge their interests in their kind. It is likely that the burden of the individual upon himself is much less grievous in the best societies of to-day than it has hitherto been. That such is the case is pretty well shown by the tone of the literature. The note of despair, the cry as of the victim before the altar, which has so rung in the past is little heard now, except from those who are evidently weaklings or are merely acting a part. The old selfish humour appears to be giving place to a quality of devotion in which, while there may not be as yet much hope of a future, there is the calmness of strong men who do not feel themselves or their fate so keenly as the ancients did.

One of the helpful qualities of our civilized societies is that their institutional life in many and varied ways serves to give men firm ground on which to found their forthgoing sympathies. In the primitive tribe there was no more than the imperfectly limited family, the gens, and such religion as had been developed to which these emotions could attach themselves. The development of the family which came with the establishment of monogamy, and its ever-increasing freedom from pollution, has made the household the ark of a new covenant among men. This gain in the home condition is a matter of relatively modern times. It has come about through the extension of the altruistic spirit.

So, too, the modern security of the city and the state has afforded enduring associations very different in their fitness to command the affection of their members from the temporary and ever-menaced tribal organizations. Religions have also gained in dignity and permanence. Those who are members of a common faith have something to which they may cling with a sense of safety that earlier times denied.

Not only has civilization safeguarded the ancient institutions of men, but it has given rise to a host of new establishments such as were unknown in the earlier forms of human associations. In every high-grade modern society we find a great array of these institutions such as do not exist in the savage or barbaric state of man. There are business houses, corporations of various kinds, all of which are intended to have a life beyond that of the generation which conducts their affairs. There are societies and clubs designed for the pleasures or protection of their members. The churches are such institutions in their quality—i. e., they have the kind of permanence which men so hunger for as a corrective of their individual short lives. Last of all, there are the charitable and educational foundations which provide for the highest grade of altruistic devotion, which issues in well-devised work for the help of the living or of those yet unborn. These institutions not only find their shelter within the edifice of the commonwealth, they, in large part, constitute that wonderful structure. Each of them is like a tree in a great forest. It forces by its own growth the upward growing of its neighbours, so that they all rise together toward the sky. Beneath their roof men may find a measure of peace in that forgetfulness of self which is the goal to which, unknowingly, they are striving.

It is this saving quality of society, this gift it makes of institutional life, and not the mere wealth or physical well-being which it promotes, that gives it sanctity. The ancients saw in their churches hallowed by the relics of saints and the presence of their gods the most sacred places on earth. They deemed them precious because they were sanctuaries defended from all assaults. We see, if we clearly discern the truth, that our societies are, or at least are becoming, the true and larger refuges of men. We see, moreover, that the master evil of the savage inheritances of man, that of war, does not inflict its worst ills in the death it brings to the youth and hope of the state, or in the destruction of the hard-won wealth of the community it ravages, but in the overthrow or impoverishment of its institutional life, in the lessened confidence in the safety of families, of business establishments, of all the varied trusts and organized expectations which help men out of themselves. By the ancient provision of affection the losses of mere death may be at least in part healed; those which are written despair are far more indelible. It requires generations for downtrodden people, such as those of Italy, to develop a measure of confidence which may lead them to the brave work of constructing institutions. Some of them, as, for instance, those of Sicily and Greece, appear to have become almost incapable of turning their considerable abilities again to such use. Their minds have lost the habit of such deeds. They have perforce become perfectly content with a narrow round of momentary actions.

If we look upon the societies of our higher civilizations as the result of a series of endeavours which have for their most important result the unification of the individual with the whole, we not only see the best of the good that they have attained, but we are directed to the fit paths of further advance. Although I propose to treat this matter in a more extended way in the sequel, it is well to note here that the basis of social advance is clearly to be found in the development of our societies in the ways in which the sympathies may be enlarged. Spontaneously men have found this, for in all respects, except in the matter of formal politics, our societies are tending in that direction.

As the development of the sympathetic motives depends upon the means by which individuals may communicate with one another and the interest that leads to such communication, the following chapter will be devoted to a brief consideration of certain expressions of mutual appreciation.

CHAPTER VII

EXPRESSION OF THE INDIVIDUALITY

Among the lower groups of individualities—those of the mechanical order, such as atoms, molecules, and spheres—the dynamic reaction is always equal to the corresponding action that comes from the environment. The same law holds good in the organic realm: the bodies of the persons, being made up of lower inorganic units, react in much the same way as they would if they were not in a living body. Gradually, however, in a manner that we can not trace, this machinelike method of discharging the energy which is received from without is in part transformed so that a portion of the impulse sent in from the environment becomes converted into intellectual work. In this psychic field we find, in the way mental impression tends to give rise to a corresponding expression, something that reminds us of the principle that holds in inorganic forms. At its simplest this is shown in the reflex action of the muscles on a particular stimulus; with a more advanced stage by the attitudes of the body which correspond to the several emotions; in its fullest growth by the need of expressing those larger and more continuous movements of the spirit which give character to the individual life.

We may easily see, by watching our own lives or those of others, that a man needs in some way to set forth his inner life in an external form. This is most commonly noticeable in children and among other unadvanced people, when it is in a satisfying manner done by means of apparel, attitudes, or manners. Dress indeed is the instinctive and universal means by which men gratify this desire for externalizing themselves. All feel, though in varying measure, the satisfaction which this very human method of setting one's self forth affords. So, too, though less generally, our behaviour affords gratification, provided we feel that it rightly presents us to ourselves as well as to others. For the higher planes of thought we need other modes of externalization. The poet must sing, or the painter depict, and so through the list of deeds, not only or mainly because the man will have some kind of profit therefrom through the attention his neighbours give him, but because he must in a way actualize himself.

It is an inadequate conception of human conduct to suppose that all creative work is done in direct and sole reference to other persons and for the gain that may be won from their esteem. That motive doubtless enters for a very great value into the complicated equations of impulses which guide the lives of men. But, in my opinion, the larger part of their work, from their dress to their most dignified accomplishments, is primarily moved and mainly shaped by the ancient and instinctive need of externalizing the self. It is not improbable that this impulse is due, at least in part, to a natural desire for the completion of a train of thought. Those who are in any manner engaged in forming conceptions which may be given actual shape—as machines, houses, essays, poems, or whatever it may be that can be *realized*—know the curious relief which comes to the mind when the idea is brought into the form in which it is beheld with the outer eyes. Therein, indeed, is the pleasure of the creative mind in its work, rather than in the fame or profit that it may bring.

In our systems of education far too little attention has been devoted to the importance of expression as a means of inducing intellectual work, especially that of the higher order. It is fairly to be said that the development of any form of production absolutely depends on the institution of the need and habit of externalizing concepts. Unless the mind becomes habituated to this process of setting itself forth in deeds, so that it seeks to shape its thought in some external form, it will inevitably lose whatever creative power it may have been heir to. Without this habit, the person may never come to know with what powers he may be endowed, for the offerings of the constructive imagination are but dimly presented to consciousness until the external building process is begun.

In considering the great question—in some regards the greatest we now have to face—as to the ways in which we may bring individual men to the exercise of their full powers, it is most important to consider the part which the instinct of representation has had in the development of the mind. We see traces of this motive in the lower animals. It is particularly evident among the birds; and, in the form of gesture, it is well indicated in the nearer kinsmen of mankind, the monkeys. Even the lowest men, however, show a far greater need of such representation than any of the brutes. They quickly and universally acquire the resources of dress and manner. They soon advance to the stage where song and the dance serve the need. Along with these go the development of the plastic arts; and here and there literary invention helps the abler minds. When we consider these instinctive means by which men managed to educate and enlarge their imaginations, and compare that education with what our later civilization has brought about, we see one of the evils of our so-called culture. In our conditions there is little chance for the individual to grow by the exercise of any of his creative motives: he is restricted to mere imitation. This problem of the relation of the motive of expression to the development of individuality is most interesting, but it can not be more than mentioned here.

The extent to which persons are moved to represent themselves to their neighbours appears to differ greatly among various peoples, and even among the same folk in successive periods. Thus, among the French the motives of self-presentation and of appreciation appear to have been strong throughout their history. Among the English, however, an originally rather retiring and unindicative humour was, in the Tudor reigns, gradually altered until their society became in the Elizabethan time one of the most expressive that the world has ever known. This is shown not only in their larger literature and in their action, but perhaps best in the letters of the men and women of that time. In these letters, notwithstanding the euphemism that deforms them, the reader will find singularly vigorous and effective setting forth of individual quality. The people depict themselves and their neighbours in a wonderfully definite way, so that we may set them before our eyes more clearly than it is possible to do with those of generations nearer our own time. It is not improbable that the lessening of expressiveness of the English people after the close of the Elizabethan reign was due to the extension of the Puritan spirit, which was in part a revolt against the singular individualism of the preceding time. In that movement the ideals of conduct, which found their fullest development among the Quakers, led to a self-contained habit that has to this day marked the English folk of all classes in an apparently permanent manner.

There are other instances of sudden changes in the manner in which men have endeavoured to present themselves to their fellows. Some of these, as in the "Storm and Stress" period of German literature, appear to have been essentially artificial, mere intellectual fashions resembling those which control dress or gesture. In such cases they are but temporary and without much value to the student of individuality. When, however, they are of a permanent nature, such as those above noted among the English folk, they have great importance as indexes of the temper of peoples. They are very difficult to discern and impossible to estimate, save in a very general way. Yet, despite all their indefiniteness, they are among the very best indications as to the nature and meaning of national life.

In man the field of expression, other than that given by means of gesture, is limited to but a very small portion of the surface of the body. Only a part of what is commonly termed the face has any distinct share in depicting the emotions. The field is essentially confined to the area from just above the eyebrows to the lower part of the chin, a distance not exceeding half a foot—the space is little wider than the length of a line drawn across the eyes—in all, perhaps not the fiftieth part of the periphery of the normal adult. From this narrow space we gather nearly all that our kind has to tell us, save what is told in speech. What it reveals to us is limited in scope, yet includes much that words fail to convey, all indeed that makes the difference between the spoken and the written word. The remainder of the body is not without its appealing power; yet the obdurate habit of the higher races—a habit that increases with the advance of their civilization—limits the use of all else than the countenance, and reduces even its service to the utmost, so that what we find in the faces of men is but a small part of what its features might tell us. It is to speech alone that men are, under an instinctive guidance, coming to trust for the maintenance of their relations with their fellows. Herein lies the main difficulty in the exercise of the sympathetic motives. We are limited to speech or to the visible tokens that expression affords for nearly all we learn of our neighbours.

Although spoken words may, by means of the emotional tones that accompany them, give us much concerning the state of mind of our fellow-men, it affords at best an imperfect means of communication; for words are but signs that depend for their significance on the interpretation which each out of his own experience gives them. Shape them into phrase as we may, so that the separate units help to the fuller thought, they remain inadequate to convey more than a part of the meaning we would have them bear. The more individual the feeling we seek to express, the greater the difficulty of the transmission. With the advance in the richness of its vocabulary, a language gains something in its power to depict the shades of thought; yet with this advance comes an ever-increasing loss of clearness and consequent risk of misapprehension of meanings. It is evident that this condition is likely to set limits to speech as a means of intercourse, for the reason that thought is less limited in growth than this method of denoting it. It is therefore to be reckoned that, do what we may to increase the efficiency of the modes of expression, the greater spirits of the time to come are likely to be even more solitary than in our own age.

Much has been written concerning the human face, but so far as I have learned there is nothing in these writings which would serve the inquirer in the peculiar quest which he is here advised to make. In my own essay in this matter I found it best to begin by observing with some care the countenances of the lower animals. In doing this the observer will quickly find that his task is limited by the fact that the face is effectively restricted to the creatures of the vertebrate series. It is true that among the articulates the head parts are not without a quality akin to expression, and among the true insects where this portion of the body is distinct from the rest of the frame it appears to be so shaped as to make a definite emotional effect upon the beholder. But these lower countenances have not the true facial quality, for the reason that they are invariable. They may be compared with masks imposed upon the individual, with no immediate relation to the state of mind of the bearer, and with no means of denoting to his fellows the variations of that state. It is interesting to observe that the only clear approach to the human quality of countenance that we find in the invertebrates is among the cephalopods, creatures which belong in the type of *Mollusca* whence the backboned animals appear to have been derived. In the higher cephalopods, such as the squid and cuttlefishes, the head parts, though composed of structures wholly unrelated in origin to analogous parts in our own, have a look that is curiously like that we observe in the lower members of our own type.

As soon as the vertebrate series has attained the first considerable upward step and has come into possession of a head, we find that this structure is formed of parts which in a general way lay down the plan on which all subsequent advance is to be worked out. There is a box to contain the brain, and on its front part are placed eyes, mouth, and, it may be, other organs of sense, so that the face is outlined for the subsequent history of the series. In the fishes and thence upward through the reptiles, batrachians, and birds the countenance has little if any range of expression. It is hardly more indicative of states of mind than are the head parts of insects. Where there is any indication of emotions it is commonly signified by movements of the body.

Thus, among the birds, which are of all the lower animals the most intensely moved by love, hate, or fear, the attitude of the feathers or the expressive motion of parts other than the face serve to set forth the state of mind.

When the vertebrates attain to the level of the suck-giving animals the face no longer has the rigid quality which characterized it in the lower members of the series. Scales and feathers are replaced by hair and skin, beneath which lies a considerable array of muscles, some of which quickly become devoted to the uses of expression. They draw the flexible parts about so that the face may indicate rage, grief, and fear. It is doubtful if any other emotions are distinctly set forth except these, at least until we attain to near our own kind, except in the domesticated dog, a creature which man has managed to make in many ways an image of himself. Even in these humanized brutes the range of expression is due rather to the attitude of the body than to any considerable play of the features. There is, it is true, a look of the eye most human in its quality not due to a movement of the muscles, and as difficult to explain as in the like changes of our own, that tells the spiritual kinship of the dogs with men more perfectly than any mere play of the features could set forth.

When we come near to man in his collateral kinsmen, the monkeys, we find that the hairy covering of the head, which in the lower species limits the possibility of the face, begins to be more irregularly disposed than before, so that some parts of the countenance are left bare, while the covering is elsewhere thickened in a manner to heighten the whole effect of the covering. It is here indeed that we find the beginnings of the human countenance as a part of the body; not as in the lower forms, merging backwardly by insensible gradations with the rest of the form, but set off from it by rather distinct limits. Here, too, we observe nearly all the more striking elements of expression that are to be found in the human face, not only the primitive emotions as there delineated, but merriment, sorrow, expectation, and contentment are almost as effectively told as in mankind.

If after this glance at the natural history of the face we turn to its condition in our own species, we observe that in the passage from the lower plane of the anthropoids, such as the gorilla and chimpanzee, to the most brutelike savages, no distinct formal addition is made. Every feature, to the lesser details of the parts, is in common. Even in the resulting expressions the variations, though great, are not so in kind but in degree. Notwithstanding the fact that the human face has in its highest states an indefinitely, we might almost say an infinitely greater amount of expressional work to do than that of a chimpanzee, it has really no additional means of attaining the results which are to be accomplished. This limitation is but a part of the strange control that has denied man any structural or functional advance in his body, while it imposes on him a vast array of needs and duties unknown to his lower kindred.

The very scanty physical means whereby the mind of man may tell its movements has led to some curious effects. Among these we may possibly reckon the development of speech, which has come among the most highly developed peoples to be almost the only mode of conveying intelligence. It has coincidently led to an utter neglect of the countenance as an instrument of deliberately intended expression. All cultivated people recognise the power of the instrument, but with them its use is limited by certain prejudices to situations where, as in the actor's art, it is understood that it seeks only to show us what men could set forth in their faces were they socially free to do so. It would be interesting to consider this curious position in some detail, but we need note no more than the point that, owing to the restraint, the faces of completely civilized people appear so far expressionless that they are likely to be exceedingly uninteresting to the novice in the study of the countenance. He will therefore do best to begin his observation by noticing the faces of children where, though the range of motions depicted is limited and the habit of restraint is early acquired, or possibly inherited, there is a measure of freedom in the delineation. When he is accustomed to watch faces he may profitably extend his study to adults of his own people. He will then be prepared to see that these masked visages are really less inscrutable than they might at first sight appear. The signs of emotional movement there set forth are subdued but not extinguished.

As soon as the observer has overcome the idle, commonplace way of looking upon the faces of the people about him and has advanced a way in the royal art of reading something of what is therein, he will find himself possessed by a singularly intense interest in his task. There is indeed a strange fascination in the study of faces. No other objects in this world so deserve and commend attention, yet there is none other in the visible realm so completely neglected. We look to them for the most that the world has to bestow. We are in despair if we can not behold them, yet our seeing is done in an instinctive, trivial manner that is satisfied with the fulfilment of the momentary need, asking no account of the depths. If the student will break past this wall of inherited habit that limits the interest in faces to the momentary needs of human intercourse, he will most likely be led on until indeed he may have to restrict his interest in this inquiry lest he become controlled by it in an excessive way. He may find that these countenances of men tell him more than it is convenient to know of his fellows, that he is too much moved by the sense of sympathy with them which the understanding arouses. He is likely to come to the conclusion that the common neglect of faces may be due, in part at least, to the need of limiting the range of the altruistic emotion. It is only the very rare and large man who, by his nature, is fitted to go forth to many.

To the observer of individuality the study of faces affords a fit crown to his inquiries. He sees in them the summit, so far as we can discern, of the forces of the ages that have tended to build these isolated complex beings which take from the past, act in the present, and send on to the future the wonderful harvest of experience; each in itself at once perfectly separated, absolutely unique, but knit to all others by the power of exchanging influences by which power their ancestors have developed from the lowest estate to the station of man.

CHAPTER VIII

APPRECIATION OF OTHER INDIVIDUALITY

The measure of the appreciation of the individual by his fellows in a general way increases with the advance in intellectual power. At first among the lower animals this appreciation is of the mate alone; with a gain in mental power, it extends to the progeny. Further on and up it goes forth to the herd or tribe or even to the kindred of the species. The obvious tendency of human development is steadily to augment the value of the impression which men make on one another. If we could contrive to ascertain the average intensity of this effect we would thereby obtain the best possible measure of the relative moral station of different civilizations.

Although the result of the civilizing process is on the whole to make men more keenly conscious of their neighbours, in part for the reason that they thereby become helpfully dependent on one another in more and more varied ways, there are certain influences which are developed in complicated societies which tend to limit the mutual appreciation of its members. Thus, the caste system in any of its varied forms is an effective means—we might almost say a contrivance—for restricting the impression which persons should make on one another. So, too, in our crowded communities, the impossibility of attending to more than a few of them breeds a habit of neglecting the natural claim our fellows make upon our minds. Persons accustomed to dwell in associations where it is possible to obey the instinctive impulse to regard those with whom they come in contact, are therefore distressed when they move about in a crowded city. They have to give over the ancient and admirable custom of recognising each of the bipeds as one of their own kind, entitled to some measure of sympathetic attention, and in self-defence to regard them as mere moving things.

It is interesting to note the gradations in the appreciation of the other individual, and to observe how far they relate to the natural history of the process by which the person has become appreciated by his kind. First and by far the strongest of the presentations of the other is that brought about by the excitation of the intelligence arising from a combination of its powers with the sexual motive in what we term love. There is no doubt that through this connection of the most primitive impulse with the higher mind the strongest and more complete sense of the other is attained. It is due to the fact that the sympathetic motive here at work is the most ancient and deeply seated of all we inherit. It goes back for its origin to the very foundations of life.

Only less intense in its power of presentation of the individual is the affection of the parent, particularly that of the mother, for the child. This, too, is an old, long-founded motive; but it dates not so far back in the history of life as the sexual impulse, and on this account perhaps is of less dominant value. The motives that lead to friendships had their foundations laid far later than the primal impulses before noted, and their effectiveness in directing the attention to the neighbour is correspondingly less strong. When we come to the latest form of altruism—that which is devoted to men as men, quite without reference to other and nearer relations—we find the motive inconstant and of little intensity. Save in the very few, it is as yet imperfectly developed.

In looking forward to the future development of the attention of persons to one another, it is possible to find some guidance from the evidence of history. It is in the first place clear that the presentation effected by the sexual desires is in a general way, with the advance of mankind, steadfastly becoming ennobled. It may be in our day less intense than in earlier times, but the change, if it has occurred, has been attended by a distinct enlargement of motives that enter into the plexus that constitutes love. There is reason for the belief that lovers are really in a large sense more to one another in our time than they were in that when their emotions were set forth in a more passionate manner. A wider appreciation of human relations has served here, as elsewhere, to alter modes of expression without in any way diminishing the impulses which are involved in the actions.

In the relations of parent and child we note the same sobering effect of enlarged understanding which is to be observed in love between men and women. If we would find the primitive turbulent form of that affection which is characteristic of the species, we will have to seek it among aboriginal folk. Civilization with its improved knowledge has made the normal family much less picturesque than it was of old; but it has given the association a value which it could not have when it rested on the ancient instincts alone. The child is no longer a mere beloved possession, it is a great responsibility as well, and the gravity thereof is ever enhancing with the increase of our knowledge. There is no less love of mother and father for their offspring, but there is much more of thought in the relation than of old.

The only relation depending upon the presentation of the individual to his fellows which appears to be undergoing a change that can be counted as for the worse is that of friendship. It appears probable that friendships of the ancient type are less common and of a less devoted nature than in earlier centuries; moreover, that our conditions are steadfastly making that relation even less necessary to the lives of men. There are several reasons for this, none of which are unsatisfactory to the philanthropist. In the first place the companionship of the family—of man and wife, of parent and child—has in our societies a place altogether above that attained in earlier times. The ancient despot of a household rarely won friendship beneath his roof. Even if he were the most gracious of men the shadow of his power stood between him and his subjects. He therefore had to go abroad for associations which should have that equality of rights and obligations which alone affords the foundation of true friendship. Again, the diffusion of interest, which has served to bring about a more sympathetic relation of all the members of a community to one another, probably has operated to lessen the measure of affection between individuals beyond the family limits. Accepting, as we do, the essential kinship of all the people about us, going forth to men in general in a way unknown in earlier centuries, there is a diminished need for intense friendships of the type we find described in the literature of earlier times. The change accompanies the marked diffusion of interests among cultivated people, which is an eminent characteristic of our age.

It is a matter of much practical importance that we should understand the essential difficulty we have to encounter in our efforts to comprehend the nature of our neighbours. The effect of custom in this perennial task—as in all other like experiences—is to develop a commonplace state of mind which leads us to accept others of our kind as mere duplications of ourselves. Our consciousness, happily for our comfort, but, as we know, most falsely, presents us to ourselves as simple beings of the moment, with no more complication than exists in the material world about us. If we could look into the depths of our nature, into the ages of its history, and the vast store of inheritances manifested and concealed that go to make up the complex, the spectacle would be overwhelming. It is therefore well that we see no more than we do into the depths of our nature, and that we are even more limited in our knowledge of our fellow-men.

The first step in our effort to understand our kind should lead toward the recognition of the profound individuality of each of its members. To attain this it is necessary to look well to the fundamental postulate of all our social intercourse, which is that of the essential likeness of men: that our neighbour is in effect ourselves in another body. There is perhaps no other of the necessary assumptions on which we found our common life that contains at once so much of truth and of error. In the prehuman stages of our series, at least among the simpler animals, this instinctive claim as to the kinship of the neighbour was to a great degree valid. But with the advance in the intellectual complication, which we observe in the higher mammals, even long before the advent of man, this likeness of mental quality begins rapidly to diminish. In our own species the body of intellectual inheritances and the multitude of their interactions is vastly beyond what it is in our lower kindred, so that the individual of our estate is parted from his mates in a measure that is in no wise indicated by the peculiarities of his aspect. For while men differ from one another in body in a far greater measure than any other species of mammals, these physical differences are trifling as compared with the spiritual. If we could contrive to see the minds of men as we behold their frames, the creatures would probably appear to us as diverse as the most widely separated organic forms.

The spontaneous assumption we make as to the essential likeness of men is doubtless founded on the recognition of the fact that in all the simpler and more important relations of the individual, like experience leads to reactions generally similar to our own under like conditions. Because they laugh, or weep, or are vexed where we are thus affected, we conceive that they feel just as we do. This judgment is instinctive; it is the foundation of the best the world gives us; it must be taken as true. At the same time it should not blind us to the fact that the proof of correspondence in what is behind the acts is most imperfect, and that this proof relates only to a very limited part of the nature of the being, for the greater part of its nature lies in fields where this method of comparison with ourselves can not be effected. It is not unlikely that the instinctive postulation of the kinsman as ourselves in another form is an inherited notion, coming to us with the great store that has been transmitted from the lower stages of life where it was nearer to the truth than it is in our present stage of existence.

If we approach the question as to the individuality of human quality with open eyes, we soon see reason to qualify the judgment to which our forerunning sympathies lead us. In the lowlier plane of thought and action, in all that relates to man as a mere intelligent animal, and in most that is evident in the mere savage, the likeness is evidently near enough for all the uses of society which is founded on these simpler features of man's nature. But as we rise to higher levels of the intelligence, the effort to win sympathetic contact becomes more and more difficult, until the detachment becomes so complete that each being has, perforce, to dwell apart from its kind, with no more consolation than what is afforded by a vague sense that others must surely feel even as he does. Although language, gesture, and that marvellous instrument of expression the face, may do much to set him forth to his fellows, the capacities which part him from them tell him that the separation is complete and in no wise to be avoided. He learns that the sympathies can help him only in the ancient relations where the practice of ages gives to the touch of hand or tone of voice the power to bring the blessed sense of oneness with the neighbour.

Perhaps the surest way to a clear recognition of the essential mystery of the individual man is to note the instances in which the greatest have lived among their fellows without recognition, effectively hidden while they lived by this garb of a common humanity, not to be revealed until the masquerade was over. The man who, more than any other, has shaped learning and set the paths in which it should go onward for twenty-four centuries was, to those who knew him, "the vain and chattering little Aristotle"; and the Greatest that has dwelt in this world was, to the understanding of educated Romans, but a fanatical peasant who disturbed the peace of Jerusalem. It is this essential isolation of the higher qualities of the man which makes the prophet without honour in his own country or time. The more truly the prophet, the surer he is to be parted from his people. It is only when his grave has served as a stepping-stone that they attain a station where they can sympathize with him.

Something of the loneliness of the prophet belongs in the life of every man who rises ever so little above the simplest round of human cares and comforts. Whenever tempted by the deeps he ventures beyond the primitive domestic fold, he is at once parted from his comrades. Necessarily alone, he must for his protection seek an ideal sympathy with the unseen. So it comes about that a new kind of affection is developed—one that does not concern the knowable fellow-being, but the invisible mate—the ideal of the kind, the state, the divine, wheresoever the spirit may find it. Those who journey far on this way are in the end fortunate, in that their new devotions come at last to include the old, giving to the homely things of the common life a dignity and largeness which lift it to the higher realm. Most men, however, do not attain this reconciliation. For their more enlarged existence they have to dwell apart in their individual realm of hope and fancy. In various ways they may seek to express their feelings to those who are about them. They may, after the manner of poets, make a profession of their feelings and so win bread or fame from their attempts to disclose themselves; but the essential quality of their inner life remains remote and really unexpressed by such action. Who supposes that Shakespeare was ever really known to his best friends? It is indeed to the inevitable isolation of such a genius that we may attribute the doubts that beset many people as to the authority of the works commonly ascribed to him. They ask why such power was not shown in his aspect, in his face, and in his ordinary contact with men. The answer is that the features and customary actions of men have been shaped for the uses of the common ancient life. The newer and seldom spirit has no such effective means of presenting itself to our eyes. For its use it has words alone which fit the need imperfectly and in very limited ways. So it is that the Stagirite seemed vain and chattering, and the Christ, to all save the few, a poor fanatic who might conveniently be swept away.

The larger view as to the nature of the individual man to which we are brought by a study of his conditions may seem at first sight to limit the range of sympathy for our fellows. Even a little experience will show that this is far from being the case. About the most effective bar to the altruistic movement of the spirit is to be found in the unstimulating acceptance of the kindred as mere repetitions of ourselves. Thus considered they appear covered with that dust of the commonplace which hides from us the splendour of this world. When we come to see them not mere other selves, but as beings, each moving in its own orbit, inevitably and forever alone, yet needing and seeking all the cheer that we can send to them across the dreadful void, we find in this larger understanding the source of a deeper love than we have known before—a love that is mingled with the reverence the ancients gave to their gods, which our better knowledge shows to be the due of all men, even the humblest.

There is no foundation for enduring affection so sure as dignity. Therefore, all we can see of the real splendour of the individual helps to affirm the bond that unites us to him.

When the full meaning of the individual life comes to be adequately conceived, we may expect to see a new and higher order of human relations based on that better understanding. There is no reason, however, to believe that this gain in knowledge will in any measure change or diminish the ancient accents of the sympathies. Men will, as of old, be nearest to one another in those parts of their nature where the inherited instincts most move them to union, and where the instinctive means of expression provide the means of intercourse. The love of parent for child, of lovers for each other, of men for their institutions, are unshakably founded, and no extensions of motive can do more than magnify their value. But beyond the region of the simpler relations, where the experience of the ages has made everything familiar, and all too commonplace, we are to learn that there is a vast realm of the other and remoter individuality, mostly unknown to its possessor, and absolutely parted from his fellow-beings, however near they may be. As time goes on, and the arts of setting ourselves forth are bettered, we shall doubtless gain in the capacity to draw near to our mates, in those portions of our natures that are not now vivified by such contact. All the modes of literary expression lead toward this good end of bringing together the men who would else have remained remote from the influences of sympathy. Yet the relief that can be hoped for in the future from the growth in the means of passing the gulf is not great. Thirty centuries have given little or nothing of gain in the way of speech, written or spoken. For in such work no man of to-day has done better than he who wrote the story of Job. In gesture and the related sculpture we tell less than the masters of old; in painting hardly more. In music alone has the last thousand years helped men to express themselves. There, indeed, is a most substantial gain, one of which the possibilities are as yet by no means exhausted. Something of further advance may be won in this endeavour to convey a knowledge of our feelings in the remoter experiences of the mind through the statement of scientific concepts. As commonly understood, these appreciations of nature are supposed to be purely rational, and thus to lie beyond the sympathetic field. Such indeed is the case so long as they are unfamiliar and therefore with difficulty grasped, requiring for the process the vigorous attention of the mind to the logical order alone. But when the new truths become familiar they will begin to have an emotional content, or at least be nearly, if not spontaneously, linked with feeling. If such a union should be established it may come about that through mutual knowledge men may gain a fairer means of union. Something of this gain has already been won, and we may hope for the time when far more of it will be at the service of man.

While it may interest us to speculate as to the betterment of the means by which the void between human individuals may be here and there bridged over, we can not fail to see that it is in the very nature of these units of all degrees to be parted from all others, and that the measure of this separation increases at each stage of advance in the organization in something like a geometric ratio. When we attain to the station of man we find a creature in effect infinitely more isolated than the atom. Moreover, every influence that makes for culture, reacting on the inherited complex of man by carrying him further into the field of individuality, serves to increase this feature of his life. Thus there seems to be no chance that the creature will ever be made effectively nearer to others of his kind, but rather that he will have to find his final comfort in a sense of reconciliation with the Supreme. To that end science and religion alike lead.

In the field of practice in human relations a sound view as to the nature and meaning of individuality may help us to a larger method of dealing with ourselves and our fellow-men. It is not to be expected that those of to-day or of the near future will be able to pin the story of the new concept on their sleeves and make it an ever-present guide of conduct. Such is not the ready way in which learning, however well transmitted, acts on the minds of our kind. The order of the influences which determine the intercourse of men is so compact and fixed that there is scant place for the newcomers. If such arise, it is slowly and by a difficult process of displacing the veterans of the host.

To go but a little way into the large problems of morals which this view of the mind opens, it may be said that the first rule for conduct that it indicates concerns the relation of the men to themselves. It is evident that when men come to recognise that they are not merely the bit of mind stuff which is revealed by the tiny light of consciousness, but that each is a great realm that has almost unlimited extension into the past, and like possibilities of unboundedness in the future, they will respect themselves the more for the better understanding. Such gain in dignity will be a most precious acquisition; for, as before remarked, of all the ordinary ills of mankind, those arising from personal undervaluing are the most ineradicable. So, too, in the social relations, all that makes for a high conception of the fellow-men serves to better the circumstances of our contact with them by making us feel the nobility of the neighbour and the essential majesty that is behind his commonplace aspect. Nearly all the value of life comes from the esteem in which we hold our fellow-men: it is indeed but the reflection of our judgment of what we are. If they seem but mean trifles, then we can be no more; if they appear to us august, we rise to a like station. Therefore, at the foundation of all morality lies the standard by which we measure ourselves in measuring others.

It is not to be supposed that any one of us can take with him into his daily contact with people the views which are here urged as to the mysteries and splendours of the individual man. The commonplace spirit of life has us, perhaps happily, so well in hand that, picture the deeper truths as we may, the next person we meet will present himself in the familiar shape of a common mortal. But much reflection on these matters will induce some change in this habitual inattention to all but the visible presence, so that in time the observer will find that he sees further and deeper than he did before. Especially in the ordinary crises of life, when those with whom we are associated claim our special attention, will it be found easily possible to turn our philosophy to account. We may thus have practice in bettering the art of intercourse, by holding fast to the knowledge which should clear away what is cheap and brutal in our judgment of the neighbour. By such wholesome lessons we may hope to break down the ancient evils of the modes of contact with our fellows—those habitual states of mind which were developed in the ignorance of our lower life—thereby giving the sympathetic motives a chance to do their appointed work.

I am tempted to go one step further in this excursion, and to note once again that those who would better their appreciation of individual men will do well to study their faces. At first this advice may seem to be more than unnecessary—it may, indeed, appear preposterous; for what do men know, if it be not the countenances of their kind. From the time we begin to see that of our mother to the moment we die, our lives are spent in such regarding. Yet, if I may trust my own experience, and what I can discern of others, we do not really attend to this source of revelation, and fail to win its true value. Here, as elsewhere, custom has bred in us the habit of doing our task with the least possible expenditure of effort, and of going no further than we are impelled by need—except it be from affection, we look for no more in the face than we have to know for the momentary quest. Even that little we seek in an instinctive manner, and not with any effort to develop skill in the most important art of reading the signs of men. Thus, although the face tells only a small part of the story of the individual, we fail to make any considerable use of what it sets forth, and so lose one of the ways of extending our sympathetic understanding with our fellows.

In all the estimates we have to make in the field of duty the value we set upon the individuality of our fellows enters into the reckoning. It is the base from which we make all our determinations as to the conduct of life. From it we learn the possible heights and depths of human nature. In the ordinary commonplace way of looking at our companions, a way that has been affirmed by ages of experience, we conceive them as essentially like ourselves. This conception is, so far as it relates to the essentials, manifestly true. It is indeed most important that the first instinctive impression which the neighbour gives us should be of this likeness, for on it is founded all our personal sympathies. Up to our present station in the development of the social relations, the higher powers of the mind have had little share in that process. It is now time that we should enter on another and more elevated plane of these emotions, one where the understanding as to the nature of individuality may well show us that the kinsman is much more than one's self; that along with the comforting identities there exist diversities which part him from us as by the spaces of the stars, making a perfect union impossible, but affording an endless opportunity for advances toward that unattainable end.

At first sight this idea of the solitariness of the individual may seem to oppose a barrier to the extension of the altruistic motive. What reason should we have for seeking the friendly union if at the outset we have to assume that such a union, in any approach to completeness, is impossible? Let us, however, remember that all the real goals are not to be won. Complete learning, perfect peace, the utmost development of our abilities, or the ends we seek in the ways of religion, are all confessedly unattainable. They are noble for the reason that they lie away in the infinite realm and have never been grazed by the chariot wheels. So, too, we may expect it to be with our friendships and nearer affections. When they are enlarged by the better understanding they will have a more spacious quality than before. Lovers and friends will hold none the less firmly for knowing that, near as they are to one another in the elementary human qualities, they are inevitably separated by the diversity of their further natures. We may indeed hope that through this enlarged sense of the person, of the wonderfulness of its coming through the ages, the pathetic dignity of its isolation, and the swift going to the dark realm, will do much to clear away those ancient ills of intercourse which arise from the excessive judgment of others by ourselves.

Beyond the immediate discernible profit which may come from a better recognition of the nature of the person, we may well reckon on other and more far-reaching gains which time will bring to those of the hereafter who shall more fully share in the wider view. We of this age are hindered by the traditions, in their controlling power like instincts, that have been handed down to us by our ancestors and are inwoven in our social concepts. They of the later age, we may hope, are to dwell in the understanding that every person is not only hedged about with divinity, but is in himself essentially divine in his isolation.

The surest gain that can come from a better knowledge of the nature of the individual will be found in a truer estimate of our own value. Taking themselves as men commonly do for no more than the trifling part of the self that appears in the field of consciousness, with no motive of training impelling them to explorations of their personal realm, they almost inevitably come to a mean conception of their selfhood. While that humility which rests upon broad knowledge and is affirmed by high ideals may be helpful, self-contempt due to ignorance is the most harmful of all our misconceptions. To it is due more of the baseness of men than is caused by all their passions. When it becomes habitual, as is the case with most who have lost their youthful confidence, there is no longer hope of achievement or of other than formal enforced virtue. All that our societies have gained has been won by men who saw beyond the bounds which limit the vision of their fellows and have striven to actualize their enlarged views. Not one in a hundred attain to such vision. Not one in a thousand of those so blessed see in any long perspectives, for the reason that they can not look beyond the mere rushlight that the ordinary understanding of a man concerning his nature sheds on his personality.

So long as men take themselves as accidents, with no past beyond the limits that generation sets to them, they can have no basis other than their enthusiasm or the blind faith it breeds for any exalted conception of their place in Nature. Coming upon minds thus uninformed, the revelations of physical science as to the vast spaces, the interminable ages, and the mechanical order of the natural universe, serve only to appal. But if they can be brought to see that they are themselves a part—the most accomplished part—of the whole mechanism, that what has been doing in the eons since the matter of the universe began to gather in the spheres has steadfastly worked for their creation, then indeed they will feel that the realm is their mother and that fear of it is a shame.

It must not be supposed that this state of mind can be gained by mere knowledge, by the blind acceptance of the teacher's statements, or even by the fullest learning. If won at all, it is at the price of much reflection on the sequences of action that have served to bring the individual of our estate by means of an infinite succession of parentage from the lowliest atomic to the passing stage to which we have attained. It is by the exercise of the constructive meditative imagination, which has given us all the greater revelations of science as well as literature, that we may attain to this crowning result of understanding. It is by the exercise of this power alone that men may come to behold their true place in Nature.

CHAPTER IX

FEAR AND VALOUR

We have now to consider the natural history of two contrasted motives which have necessarily had much to do with the attitude of men toward death—motives, indeed, which afford the primitive impulses that have mainly determined the instinctive and traditional attitude of men concerning this crisis. Those motives are fear and valour.

Fear is evidently the most permanent of all the emotions in the animal nature. The sexual desires and hunger may at times be stronger; but they are temporary or intermittent, while fear is, from birth to death, ever ready to spring into the command of the creature. The universality and activity of fear in all animals which have enough intelligence to appreciate the relations of their surroundings to themselves is well accounted for by the theory of natural selection, though on this as on other cases it will not explain the origin of the motive. Here, as elsewhere, it is seen to be competent to nurture the seed, but not to create it.

It is, as we have seen, in the nature of an individual to be assailed by its environment. The most of its gains and losses come alike from that field. It has ever to apprehend assault that may bring pain or death. Hence, those creatures which are most fearful, up to the point where they may expend a destructive amount of activity in fleeing, are the most likely to escape from danger, and in consequence to survive. Their offspring will inherit a measure of their timidity, so that the motive may be further accumulated by selection. Thus, the work has gone on until all the intelligent species are quick to fear—a condition which has proved advantageous to them; it indeed accounts in most cases for their survival. Even the greater beasts of prey, those species such as the lion and the tiger, are, when not enraged, very sensitive to fear; so, too, the largest of the mammals, the elephants and the whales, which we might suppose free from dread, are ever watching for danger.

It is hardly too much to say that fear has been the great quickener of the intelligence—the most effective spur to awaken the mind, bringing it to a sense of the world about it. The amount of discernment necessary to find the food, or the mate, is limited, calling for few decisions, and those helped by the senses in an effective manner. But the judgments that fear requires are incessant. They must range far in space and concern a great variety of things. It demands a swift and, within the limits of the needs, accurate classification of all cognized objects into those which are harmless and those which are harmful. To it we probably owe the motive of curiosity, which awakens the sense of danger and leads animals to risk that which they dread, in order that they may the more clearly discern its nature.

There can be no question that fear was absolutely necessary in order that the higher organic forms should be effectively adjusted to their environment. It is an ancient and valuable mentor: it has guided life from the lower to the higher estate, not only our minds but our bodies bear the useful marks of its control. The quickness of will, the readiness in the use of the instruments of defence, the swift response of all the powers to the summons of need, are in great part due to the habits that fear has bred in us all, man and brute alike.

When man came from the lower life he brought with him a large share of animal fear. His ancestry had from the beginning belonged in the groups of fleeing rather than to those of fighting animals. In fact, there is no other creature of his size who is so singularly deficient in natural weapons. That he quickly became converted into a masterful combatant was due to his peculiar mental relations to the world about him, to his progressive desires, and to his capacity for rational and associated action. Although all record of the first stages in the humanizing processes are lost to us, we can still see what appears to be a remnant of it in the lower savages. There we find the emotion of fear nearly as well indicated as among the monkeys. The creatures are evidently at all times quick to it, watching the beasts, their fellow-men, and the elements for the signs of danger. We see there, too, abundant signs of another and complementary motive, that of valour, which is to play so large a part in turning the beast into the man. This is shown in the lower peoples; it becomes strong as they advance; it is one of the surest gauges of the station in the ascent to which a people has attained. In all the mammals above the level of the pouched forms, and perhaps even there, as well as in nearly all the birds, we may commonly observe the humble beginnings of the valorous motive. It comes in this way: as the family or the herd gains coherence the offspring are for a time beside the mother and in her care. While thus in the position of the defender, the mother is evidently quicker to feel the impulse of fear than at other times; but she is even as quick to put it aside, or rather to submerge it in the rage with which she meets the assailant. Where the male and female dwell together as mates the father will, at times, show a trace of the same protecting motive. This, however, is rare; it is the mother who, in nearly all groups of mammals, shows the way of our escape from the ancient, self-guarding fear into the higher sympathetic realm. She is the first to be brave; she remains, even in our own species, by nature the bravest when the danger moves her through the emotions to action.

Where the family passes into the herd we find in most instances that the defence of the association comes to depend on the males—sometimes on the single head of a gens, more commonly on a number of associated males. These mature males acting as the watchful defenders of the herd are a distinct feature in the high *Mammalia*. Even among the excessively timid apes they feel their obligation of duty to the weaker members of their community and will do battle to defend them. Darwin quotes an account of an incident where a drove of monkeys was pursued with hunting dogs. All were fleeing as best they might when, in his panic, one of the younger of the herd took refuge on the top of an isolated stone. Seeing his plight an old male monkey turned back, fought his way through the dogs, and managed to bear his charge away in safety. Any one who has seen the terror that monkeys have of dogs will recognise that this act was in a high measure valiant. It has in it much of valour in its best human form. Nothing else in the records shows so well the spiritual relation between our collateral kinsman, the ape, and our own kind.

By his inheritances man is entitled to be the most timorous of the larger animals, for he belongs, as before noted, to a singularly noncombatant group. Moreover, by his intelligence and the constructive imagination which goes therewith, he adds to the sources of fear which his senses bring to him a host that people the unseen. He extends the ancient terrors until he creates a fancied world of terrors, one happily unknown to the life in the earlier days and the lower stages of being. The most of these fears have gathered around death, which now, distinctly recognised as it never was before as an inevitable event, becomes the central point in a vast framework of emotional and intellectual constructions.

Among the animals below man the fear they have of danger clearly does not include that of death. There is no reason to believe that the idea of the end of their individuality ever occurs to them. All the steps that may lead up to the finish arouse terror, but the sight of their dead companions, if there be no show of blood, appears in no case to excite more than curiosity. If they have any idea of their condition it is, most likely, that they are sleeping. Only in a few species of *Herbivora* does the smell of the blood of the kind appear to be disturbing. It is, in effect, impossible that death can have any meaning to the brutes, save it may be in the case of the higher apes and with the humanized dog. We see nothing in their acts that leads to suppose that they find in it a matter for questioning. If we should seek some one mark which, in the intellectual advance from the brutes to man, might denote the passage to the human side, we might well find it in the moment when it dawned on the nascent man that death was a mystery which he had in his turn to meet.

From the time when man began to face death to the present stage of his development there has been a continuous struggle between the motives of personal fear on the one hand, and valour on the other. That of fear has been constantly aided by the work of the imagination. For one fact of danger there have been scores of fancied risks to come from the unseen world. Against this great host of imaginary ills, which tended utterly to bear men down, they had but one helper—their spirit of valiant self-sacrifice for the good of their family, their clan, their state, their race, or, in the climax, for the Infinite above.

Even with the lower savages we find that courageous self-devotion is placed first among the human qualities. In every stage of human advance it is greatly and, as it seems to some observers, excessively valued. Why, it may be asked, should we select this motive of valour, this death-facing motive, from all the other qualities to set it upon a throne for admiration? Surely the quieter, more commonplace motives of industry, faithfulness to routine duties, are, in the aggregate, of far greater importance both to the character of the individual and to the society of which he forms a part. We can well conceive a happy association without the presence of the death-facing heroes; in fact, they are the least likely of all the kinds of men to bring happiness where they dwell, for they are oftenest the prophets of unrest. But in this as in many other things where the popular judgment at first sight appears in error, we see on closer view that it is substantially right. The new life of man depended on his ability to bear down the tide of fear which came to him in part by inheritance, and in yet larger part from his limited yet vivid conception of the world which his intelligence revealed to him. In that task of overcoming fear by valour he was on the appointed way to his salvation. Rude as the path may seem, brutal as were the deeds that were done on its way, it led upward.

So long as men remain in savagery and as often as they fall back into it they value only one kind of valour, that of personal conflict with the fellow-man or brute. But with the higher states of society it gradually comes to be recognised, or rather unconsciously accepted, that there are many other forms of brave self-devotion besides those which are set in arms. While the courage of battle was absolutely necessary to the safety of the tribe in the early state of human life, advancement has depended on other forms of the motive which go to overcome a host of other evils, those not to be overcome by arms, and which in their removal require a less primitive and picturesque, but as effectively valiant spirit as the deeds of war.

If there were any means of measuring the relative amounts of courage that had gone into the physical and the moral struggles of our people respectively, we should probably find that the moral triumphs had cost far more valour than those of the battlefield. Yet the courage of the social order must be taken as the successor of that of war, just as the other parts of our human quality are the product of the lower life. People value most the ancient forms of courage, for they see there the complete and effective tragedy. Going to death at Thermopylæ or Santiago is a vastly clearer sign of valour than is set forth by any patient, devoted sacrifice for the public good. Nor can it be denied that the courage of the fight may call for a more immediate and complete self-devotion than is likely ever to be demanded of any one, save those who have gone to the stake or the scaffold for conscience' sake.

Perhaps the largest share of valour which has been devoted to the good of man, certainly that which has been most profitably expended, has been given to a contest against the beliefs that have grown up around the fact of death. As soon as men began to see that death needed explanation —in other words, as soon as they became men— their constructive imaginations began to explore the mystery and to fill it with fancies. In its first stages this process was naturally full of evil. The primitive man could, of course, make no better gods than himself, so he peopled the unknown with a host of brutal creatures, each demanding service and sacrifice after the manner of his own chieftains.

Hence the ancient curses of sorcery and diabolism which have so weighed on man. The extent to which this evil of primitive demon worship has retarded the advance of man is just coming to be duly appreciated. In the case of many savages, it appears to be the most down-bearing of all the ills they suffer. It has been suggested that it was the main reason for the failure of the North American Indian to gain in numbers or social station. This savage is, in general, of vigorous body, fairly prolific, and of considerable mental ability, but he was so ridden by cruel superstitions that he had no chance to rise.

To the earlier and more brutal explanations of the unknown which was opened by the anticipation of death time gradually brought relief. The evil gods mended their ways as their makers grew larger in their understandings. But this process was one of slow growth. It is indeed in the nature of a religion to remain much behind the state of moral advance of the people who hold to it. Each stage of the ongoing is retarded by the conviction of the people that their gods, even those who are devils, are sacred, and that the prophet of good deserves not only their ultimate vengeance but more immediate punishment by all true believers. Every one of these steps upward has had to be won by valiant men; in fact, the wars for or against a betterment of their gods has been a most striking feature in human history.

Valiant self-sacrifice for faith is, at least to the truly civilized man, the type of highest valour. To it has gone and from it has come much of the best of human nature, including that courage of opinion, that balanced judgment as to the problems of existence which belong alike in the highest religious and in the scientific spirit; that state of mind which looks boldly into the darkness without fear, with perfect contentment with the revelation it may yield. It is the common opinion that the scientific and the religious modes of interpreting Nature are of diverse origin, and in their nature essentially antagonized. The history of human thought shows science is really an offshoot from religion. I have elsewhere discussed this question (see Interpretation of Nature, page 20, Houghton, Mifflin & Co., Boston, 1893). Though a matter of much interest, I can not further consider it here save to say that the fundamental motives of science and religion appear to me to be the same. They both seek to penetrate the unknown.

One of the most effective cures for the apprehension of death is to be found in vigorous outgoing action. Those who are familiar with savages, or with men who have been temporarily restored to that primitive state by the hardening life of the soldier, know that to such people death has little terror, and the fear of it appears not to be present except in the moment when action brings it into near view, at which time the activity serves to mask the evil. When soldiers come under fire their shrunken faces show at once that the apprehension is upon them, but as soon as they are engaged with the enemy the activity commonly restores them to their poise. It is one of the advantages of all rude and exposed life, such as that of the hunter, that in it the man wins again his natural adjustment to life and death which he is deprived of by his supercivilization.

It is well to remember that the instinctive fear of death is not as our forefathers deemed it, a dread of coming to a place of judgment, though that idea has added much to the pang. Its source is to be looked for in our animal ancestry, where this fear, blind and unconscious of its object, was absolutely demanded for the fit preservation of the individual. As the lower animals can have no understanding of death, their apprehension is surely as unreasoning as that of children in their early years before there is any distinct association of the state of mind with bodily harm, much less with death, of which they know nothing. It is this long inbred organic fear which, inherited by man and added to by the knowledge which is his alone, that makes fear of death the peculiar evil, one that we should bear down as we have to do with so many other of our qualities derived from our brutal ancestors.

As above noted, man cures the primitive fear of death where he can by overlaying it with the stronger motives of momentary action. His mode of life also helps him to the end by giving him a well-poised nervous system, one that acts mostly in relation to the work he has in hand. This simple defence is admirable, but, as we see, inapplicable to the life of the higher societies. It can, however, be replaced by other and even more effective agents. It hardly needs be said that the fear of death is utterly selfish, and that where it relates to ourselves the most degrading of all terrors. Evidently one of the cures for the evil is to be found in the exercise of the mind and body in work that distinctly relates to the well-being of others. The ordinary occupations of life afford for most people who are not affected with religious apprehensions a suitable balm, for the reason that they generally have an altruistic quality; that curative motive enters into the larger part of our activities. If the fear is such that these customary activities do not put it aside, a further attention to the needs of our fellows will surely make good the cure. It is by pushing beyond the individual to the kind, by turning our formal life out of itself toward others, that the surest relief for this inherited evil is to be gained. The remedy is ancient and effective. It has been proved by the lives of the innumerable saints of many dispensations.

The method of extinguishing the fear of death is as simple as it is beautiful. All of the horror of it proceeds from the contemplation of the self. If this is escaped, there may remain the mere animal avoidance and resistance of the ill, but the sting of it will be lacking. The one means of honourably extinguishing self-consciousness is by the consecration of the thought to interests beyond the self. This can take many shapes. With some exceptional persons it may be a devotion to purely intellectual matters; but with few, if any, does such interest become firm enough to completely engage the mind. With others it may be a devotion of a religious nature, in effect, to a contemplation of God; or it may—and best—be a motive to help the fellow-man, taking him to heart at once as a brother and as the highest type of that whole of which we are a part. Looking on the fellow-being as the embodiment of all that we know or hope in the way of the future, we may in helping him unite all the influences which enable us to combat the evils of our individuality.

CHAPTER X

THE ATTITUDE OF MAN TOWARD DEATH

While it is evident that the lower animals of all grades apprehend danger, we can not believe that they in any way recognise that they must die. To suppose that they can attain to such understanding is to endow them at once with a self-consciousness and a reasoning power which evidence shows they do not possess. The fear they have is like that of a child when it begins to adjust itself to the world about it. The little creature is full of dreads, but these relate to bodily harm and not to annihilation. It is one of the most characteristic marks of man's estate that he bears this larger fear, one unknown to all the lower life of brute and child.

So, too, we have noted that man comes to the consciousness of death with a vast store of inherited capacity for fear. This motive represents the anxiety and caution with which his animal ancestors have had each moment to apply to the world about them. The motive is the shadow of all the struggle involved in the selective processes which have done so much to guide our life up the long stairway to the plane of humanity. The dominant station to which our kind attained, even in its savage state, the mutual protection which a society, even the simplest, affords, quickly served to diminish the need of fear for its original uses. It was, however, at once applied to the newly discovered danger—that of death.

In facing the risks which confront them the brutes trust to their activities of flight or defence. They must learn to trust their bodily powers; for those that do so most effectively survive, and send their motives on to their progeny. But from this certain ill of death, which man was the first to see, there was evidently no immediate way of escape. The only way to deal with it was by the use of the constructive imagination, by explaining it in some large way. Thus it came about that the sight of the dead brought men to look beyond the visible and people the unknown with interpretations. These at first took on the shapes of the objects which had been the teachers of the lowlier life: great beasts of mysterious power, malignant foes in human form, wild forces of Nature in varied incarnations. Thus there grew up about death as a centre the beginnings of the moral interpretation of the universe, at first as embodied fears.

The advance in the altruistic and philosophical motives of men is well though confusedly recorded in the gradual development of these early explanations of the spiritual realm. We see the rude gods of the early theogonies gradually borne down by the higher creatures which are set above them. Generous deities appear, those who look upon the lower world in a kindly way. Still the demons, these embodiments of the ancient fear, live on in their lower plane. They survive long after the better understanding of Nature has forced the thought of all men from the grosser polytheisms to the conception of divine control. Yet, even when this end has been substantially obtained, when the idea of the supreme, beneficent God is established as an article of faith for which everything is sacrificed, so persistent is the ancient demonology that its fiends have to be kept for the torment of mankind. A most curious chapter in the history of thought is that in which is written the history of the conflict between the teachings of Christ and the olden worship of the fearful. Long after the religion of perfect love and self-devotion gained an apparent control over the minds of men the real mastery remained with the demons, those brutal conceptions of early man born of his inherited fears. Even now they hold their place in the minds of most of those who profess themselves Christians.

Those who have been so fortunate as to have been reared in a true Christian faith can have no sufficient idea of the torture to which the minds of men were subjected by the old-fashioned discourses on the punishments that after death assail all save the few chosen ones. The human fancy has ranged far, but nowhere else has it gathered such a harvest as in the sulphurous realms. Cruelty is a natural motive in men; it came with the vast store of good and bad that was sent to us from the lower stages of life. All the better influences of society worked against it. The teachings of Christ should have banished it from the earth, but for near two thousand years these teachings have been made in appearance to justify the endless picturings of torments upon the immortal bodies of those he sought to save. I recall the preachings of a worthy man, famous in my boyhood as a great exhorter. I can see and hear him even now, after nearly half a century, rolling out his story of the torments of the doomed, with a drone of sorrow in his voice, but with an evident relish for the cruelty that he painted amazingly well. Men and women fell down with fear and horror before that terror he forced upon them, the terror of what death may open to man. For centuries a host of able men have been at work perpetuating these brutal ideas throughout the civilized world. Can we wonder that, with this endless dwelling on the ancient conceptions of the brute and primitive man, cruelty and fear which Christianity should have cleared away still cling to men?—that the altruistic motives which naturally lead them to put aside all personal considerations of their fate should still have so small a part in their actions?

One of the best things that can be said of the century that is drawing to its close is that it has seen the end, or at least the promise of the end, of the ancient demon-worship. The physical hell, the personal devil, his imps of all degrees, the fiery furnaces, and all the other agents of torment are passing away from the imaginations of men. There is probably not an educated clergyman who believes in them. There is scarcely an intelligent congregation where the preaching that was demanded fifty years ago would be tolerated to-day. The idea of suffering for evil done is still firmly rooted in the minds of all men of sound moral nature: suffering in this or any other world until it has accomplished its fit work; but the old conception is now being purged from our religion, which it has so long disgraced.

In considering the reasonable attitude of man toward death, I shall for convenience assume that the reader believes in a personal immortality. It is of no great moment whether he so believes, is an agnostic, or holds to a firm conviction that he ceases to be as the life of his body is stilled. As a matter of fact, the essential difference between these three states of mind is of much less account than it at first sight appears to be. For the belief of those who least doubt immortality is far from being as clear and sufficient as it is concerning the things they recognise as certain. The professed doubt of the agnostic is pretty sure to have a concealed doubt in his well-guarded indifference of opinion; while the resolute sceptic if he faces the absolute mystery of the universe—a mystery which, notwithstanding all the illumination of knowledge, remains essentially unbroken—must confess that immortality is among the possibilities of the unknown realm.

The first point relating to the attitude of the intelligent man toward death which I propose to consider concerns the search for further evidence of immortality. This inquiry has always had an exceeding interest for people of a certain type of mind. They find in the obscure phenomena of apparitions, in the statements of persons in the mesmeric sleep, and like matters, what seems at first sight to be a body of facts, which in olden days were taken for absolute verities. Modern inquiry has shown that by far the greater part of these manifestations may be readily accounted for as the result of disturbed mental action, or as mere frauds. There remains a fraction of the huge mass of so-called evidence, a fraction so small as almost to be overshadowed by the doubt arising from the character of the rest, which can not be as yet accounted for. The most that can be said for this remnant is that it is quite reconcilable with the supposition that the dead live much as they have lived on earth, and that they may communicate as regards matters of no particular importance with the living.

Against this interesting though utterly fragmentary evidence that goes to show the continuance of the individual after death we have to set the apparent failure of these revelations to give us any knowledge as to matters of importance, which we surely ought to obtain from the departed were they really the source of these communications. Hardly any adult person dies without leaving breaks in his action which his successors can not repair for lack of some bit of information; yet, so far as I can find, the endless seeking for this help has never led to the least profit. There is very often the pretence of giving such help, but it turns out to be without substantial value.

It is urged by many persons who devote themselves to these matters that we have here facts of one sort or another, and as such they can and should be made the matter of scientific inquiry. To this the men who are trained in scientific methods may answer as follows: All true inquiry in the limited fields of physical and biologic science has to proceed on the assumption that the data which are used need no other purging than is required to provide against errors of observation. If there be even a reasonable probability that the material is falsified, the scientific value of the data at once vanishes. It may be claimed, however, that the inquiry can be so managed as to exclude the doubtful part of the evidence, leaving the remnant for use. This is easily proposed, but it is by no means easy to accomplish. Taking the case of the most successful medium in the history of modern inquiries, we find that in her trances she appears often to be controlled by what purports to be the spirit of a certain French physician. While thus controlled she speaks English (never French) with a perfect imitation of the manner and accent of a Frenchman, but without a trace of the Gallicisms which should accompany the tones. Moreover, this garrulous impostor was so rash as to give the date and place of his birth and something of his history. A search showed that no such person had ever lived. Here, then, we have a medium who, as she impresses every one who observed her, is perfectly honest and sincere, who when in the cataleptic or mesmeric trance pours forth volumes of material under such utterly confounding conditions as have been just noted. What can we expect of truth in the matter which comes to us professedly by the counterfeited voice of an ancient Frenchman who never existed at all? We might as well undertake a topographical survey of the land of dreams.

Thus, while the unprejudiced inquirer is likely to be led to a belief that there is some kind of truth hidden away in the mass of rubbish that comes from the trance state, he is certain to come to the conclusion that there is no evident way in which the truth can be so parted from the fiction as to afford trustworthy data for scientific inquiry. He is also likely to feel that any long exposure to the curious influences to which he is subjected in the so-called *séance* has a tendency to blunt those faculties on which scientific inquiry depends. To any one accustomed to live in the clean air of truth this atmosphere of deceit which envelops the *séance* is revolting.

Therefore I would say to those who seek to adjust their relations with death, give up the expectation of gaining this knowledge by means of so-called spiritualism. Experience has shown that so far there has been no measurable profit won in that way. It is doubtful if any like body of endeavour has ever borne so little fruit. It has commanded the devotion of many able men and not a few who brought to the task minds well trained in the methods of science; but all their skill has proved valueless in dealing with the mass of stuff which they sought to make the basis of inquiries.

To a sound-minded person who is accustomed to look upon the estate of the departed as one of dignity there is something very painful in the ignominious presentations of the dead which are made on these occasions when they are summoned by the medium. A belief in these alleged revelations can not in any way lift our conception of a life to come. For my own part, good as it would be to go onward and upward, I would rather be consigned to nothingness than to the fatuous state in which some of my departed friends would, according to these presentations, appear to dwell. As for the value of the evidence which the mediums have afforded to prove the survival of the individual, it appears to me not to be compared with that which is given us by our faith, based on our feelings, on our sense of what the unknown realm should be in relation to that which we know, on the judgment of the ages, on the foreseeing of the prophets. None of these sources are to be counted as in any way scientific, but they are quite as much so as are the revelations of spiritualism. Moreover, they are high and clean. We can lean upon them without a sense of degradation, which the other contact entails.

If we consider the position of man with reference to his future we see that it is essentially unprofitable for him to trouble himself with matters that lie past death. At best, with all his skill in forecasting, man can not well plan very far beyond the tasks of the day. Therefore, the wise of all time have been content to leave out of this life all reckonings of the deeds which may be done beyond it. Man's concern here is with the charges of this life. His hope alone may go beyond it, but it goes there with little guidance from knowledge.

The effect of the knowledge of death was at first to turn the thoughts of men with great intensity to the fears it naturally aroused. All the timorous motives were stimulated to activity. The idea of punishment after death, though in a way calculated to arouse the moral consciousness, did its work in the essentially lower plane of the mind. Then came the blessed motive of self-sacrifice in its primitive form of martial valour—the primitive shape of that divine impulse which was to leaven the lump of humanity in which it dwells. Gradually this spirit gains until it attains its full grandeur in the immortal words of the dying Sydney, and the like notes of self-devotion which have ennobled the world. The effect of this motive has been insensibly to turn men away from the contemplation of death as a personal grief. It has come to be considered in a way disgraceful, because cowardly, to set forth even to intimate friends any fear of the end that may torment the soul. This instinctive suppression of the natural dread is a result of the wide diffusion of the altruistic impulses. It is akin to the motives of decency and modesty which lead men to keep a variety of personal concerns quite out of public sight. Such conduct has undoubtedly done much to diminish the share of attention which the individual gives to this as to other matters concerning his own self. Still this fear abides, although it is decently hidden. As far as it concerns the person himself it is apparently a diminishing feature in our lives, but in relation to those who are loved it appears to be gaining, so that the aggregate of anxiety which it induces is probably no less than it was of old, though of far higher quality.

The above-noted change of fear from the hedonistic to the altruistic form is apparently much greater in women than in men. Those who have seen persons of both sexes in conditions of trial have generally noted that, apart from the mere nervous timidities which affect them as they do valiant men as well, women are much less actuated by selfish fear of death than their seemingly more valorous companions. The fact seems to be that the feminine nature has on the average gone much further on the paths of sympathy than has that of men, though the limit of this outgoing may be more restricted. More often it concerns the circle of the family or the small society than the state or the world, but it is more effective in turning aside the ancient dread of the end.

There are many reasons why the altruistic dread of death should be strong, and should grow stronger with the extension of the altruistic motives. With the development of society the ties between its members grow firmer and more numerous, and those with institutions are created, so that the life of a strong man becomes an integral part of the lives of many. Their departure is likely to make more trouble for those who survive than was the case in earlier days when, save the few chieftains, no man had numerous dependents. In our entangled time many a man of no public note has more people bound to him by the ties of need and service than famous kings of antiquity. It is this care for those who are to be left that weighs most upon the minds of men. It is so grievous that many of them would gladly accept death as the price of perfect and enduring replacement of the help they now give to those for whom they care.

As a part of this altruistic fear of death which is so fostered by the development of society, there is a dread of its coming to the beloved. Many persons—this is particularly the case with women—who have almost attained the blessed forgetfulness of their own fate, have transferred the ancient terror to the fate of children or friends. Herein lies the great body of the world's agony, which it is the part of the higher knowledge and the feeling that goes therewith to cure, even as previous advances in human nature have in good part cured the ancient, selfish, half-animal fears. Let us see if we can forecast that future and if we can help its coming.

We see at once that the fear of death which arises from the sense of the need which may befall the beloved is in large part due to the conditions of society. There is no longer much reason to apprehend that the death of a man may reduce his family to the state of brutal want as regards food and clothing. The risk is that they fall in this station to that state of penury. Although the fall may entail no physical suffering it may bring a degradation which involves quite as grave trials. As the world is, station is a very dear possession of those who have it. The question is how far can the conditions of our social motives and institutions be so modified that this danger arising from the death of the strong may be minimized.

Even a cursory examination of the institutions of our highly organized societies makes it evident that they have gone a little distance on the way that insures something more than the protection of the poorhouse to those who by death are left without their natural protectors. The system of life insurance, mainly a development of the nineteenth century, is by far the most effective of these agents. Unhappily the progressive and rapid fall of interest on capital is likely to limit, year by year, the protective value of this resource as measured in terms of labour. Still it bids fair, while the present constitution of society continues, to remain the most effective help against the most care-giving incidents of death. To this resource may be added the protection which is afforded by the innumerable associations which have for their main object the assistance of the widow and the orphan. Some of these are of ancient origin, and probably had in their beginning the shelter of their members from oppression as their sole object. With the improvement of the police system and generally right government of modern times, the main purpose of this and other like societies has come to be the relief of those who were dependent on their deceased brethren.

The motive of caring for the families of the dead finds expression not only in associations formed for this purpose, it is becoming common in all groups of men who are in any wise connected in action or history. In college classes, in the faculties of our greater schools, among the employees of great commercial establishments, and elsewhere throughout the complex of activity of our time, the sympathetic motive shows its modern development in the efforts of the living to carry forward the work of the dead, and the living who depended on his labour. Almost any kind of a tie, however slight, is accepted as a basis of brotherhood and as establishing a claim for active help. It is, in a word, evident that we are nearing the time when one of the gravest reasons for the fear of death will in large part disappear in a sympathetic relation which will insure the families of the dead against the degradation of want.

There are sorely mistaken people who think that this work of private beneficence should be replaced by some form of government pensions. While such a system, if it afforded effective helps proportional to the station of the unprotected, which it surely could not do, might have certain immediate advantages, it would, in a larger way, be destructive to the sympathetic motive, which is the most blessed concomitant of the work that is now done. So long as a man gives from his own hand, or even from that of a society that is near to him, his act is charitable. "It blesses him that gives and him that takes" alike. When done by the government the act loses all personal quality; it becomes a mere mechanical deed. The way to the end is straightforward on the path which has carried us so far: in the closer interlacing of all the human relations, especially those which are formed in the ordinary duties of life, so that all who toil together shall feel that they are brethren, each owing to the other the help in trial that men can give. Used in this way the incident of death may become, as it should be in all affairs, the inspiration to a firmer bond between men than any other basis of fellowship can afford.

There is another personal grief that death brings which is above the plane of the meaner fears, in fact is very human and with a trace of the sympathetic motive. This is the sorrow which comes with the certainty that one will soon be forgotten by his kind, at least on earth. Few know how dear to us is this place we hold in the minds of our fellows until we consider that a century hence it will be only in some chance bit of record that our names survive, and that for ninety-nine in a hundred even this trifle of a name will be denied. Only one name in perhaps a hundred million is known to men after the lapse of a thousand years, and these memories are but shadows.*

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* This vanishing of men, even where they were persons of no small importance, was forced upon my attention by an instance which illustrates the point in a striking manner. About thirty years ago, while looking up the history of New England earthquakes, by chance I made the acquaintance of John Winthrop, Hollisan Professor of Mathematics and Astronomy in Harvard University in the eighteenth century. I found at once that he was a man of power, who played a large part in his time; that he had really founded the science of seismology in that he had first applied computative methods to the observation of earthquakes; that he had made excellent observations on the transit of Venus while on what was perhaps the first scientific expedition in this country; that he was a Fellow of the Royal Society and a member of the Governor's council, the latter in those days an index of station of no mean sort. Furthermore, that from his lectures probably came the movement which led to the development of the interest of

The strength of this desire for a memory that the world must deny us because we have passed is well shown by the form of religion which dominates in China, which consists mainly in the worship of ancestors. We have here the fullest possible expression of an effort to preserve the memory of the dead, but the result is futile; it is indeed worse, as the effect is an ultra-conservation which ends, as we see it ending in a national and political life, borne down by a devotion to a shadowy past.

The cure for the sorrow that the certainty of forgetfulness brings to us is to be found, where all other balm of the soul is found, in a more perfect devotion to others—in the recognition of the fact that we pass that the better may come. They have their lives to live as we have had, full, caretaking lives, such as call for the best of their strength, for the service of the living: they should know us of the silent realm only so far as we may afford them help for their dutiful activities. To insist that they keep

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Count Rumford and Benjamin Franklin in physical science. Chagrined at never having heard of this master, I sought at once to see how singular my ignorance was. I inquired in succession of one hundred well-informed persons, including all the members of the then faculty of Harvard College, and found but three who had any recollection of the name. Yet in the society of a college town there is a greater likelihood of traditions being preserved than in the ordinary associations of men.

us in mind for our own sake would be to burden and not to bless them.

There are open to us all two other comforts in this sense of parting from the memory of men: one is that we go on our way along with all who could really know us, for that distant memory called fame is not memory at all; the other, that the real society in which we belong is quite unbroken, it endures forever. The work that a generation of men do in their associated lives is one work. Its motives stay with the race. If the men retain their individuality after death they perhaps continue in some kind of interchange of labour with one another. If they sleep, they rest with their comrades.

There is good in this hunger for a memory beyond the grave, for it is part of the great longing for companionship which has come to us from the lower planes of being, which has indeed been steadfastly gaining from the dawn of intelligence. It exists because no man can find his best and dearest self within himself, but must seek it in his neighbour. It is thus a part of the noble mystery of friendship. There is evil in it too, for it is the basis of that ignoble greed of fame which leads men to labour, not that their deeds may be well done and helpful, but that the world may long remember they once were on it. As a whole, it is an evil that may be cured by contemplating the procession of life in all its vastness, marching in its stately, endless way across this path of the sun. Whoever makes him a clear picture of this will find the impression so vast that his personality will blend into it as a raindrop in the sea. There will remain to him but the sense that he is a part of this infinite splendour.

The sense of unity with the whole of Nature, which is the largest lesson that the naturalist gains from his study of the realm, and even more from the contemplation of it, is not one of self-abasement or of the infinitely small place of his individuality in the cosmos; it is rather that he feels the whole to be in a way a part of himself. That whereunto his mind ranges is his, and that he is free to go, as the poet has it, " through all the lands and the seas and the depths of the heavens." There is, indeed, a very great difference between the sense of personal insignificance which the uninformed beholder of Nature experiences and that which the devoted student enjoys. So long as this maze of action is viewed as something foreign to ourselves it can not appear other than hostile, as brutal as the sea to the shipwrecked sailor who is fighting for his life in the waves. But when we are reconciled to this realm, when we feel that we are of it and it is of us in a common interchange, when we know that we have come from it as a child from its mother's body, all is changed; we are no longer as the drowning sailor, but as fish of that sea. It matters not that we are small, the whole is our own.

Although the development of the altruistic motives has done much to clear away the personal trouble of death, it has deepened the distress that arises from the parting with the beloved. Among primitive people, as among most animals, grief is very transitory. It seems, indeed, to have been commonly so among our ancestors of three centuries ago, when the widow was to be sought in marriage by the grave of her husband. What of sorrow has been taken from our own fate has gone to that of those we hold dear, with the result that abiding grief is one of the marks of our time. Religion in its better forms does much to assuage the sorrow by elevating the mind of the sufferer to the hope of the future, and by reconciling it to the divine will. But it has to contend with the ever-increasing capacity for sorrow which arises from the enlargement of the sympathetic motives that marks our time. Only the observant know how great is the suffering that this causes to the world: could it be measured, it would doubtless be found to far outweigh all that is entailed by the other sources of pain put together. As the evident value of life increases very rapidly with our gains in culture and in the means of high enjoyment, the regret for the loss of those who pass from it has ever a better basis of reason. The question arises as to the influence which any teachings of Nature can have on this emotion.

While, at best, knowledge can have but little effect in a direct way in controlling the emotions, and perhaps least of all in hindering or lessening that of grief, there are certain truths concerning the history of death which have, when rightly seen, a moral splendour which should give them value to the sorrowful. First of these is the story, already sufficiently told, of the place of death in the scheme of life. Whoever comes to see that death is the immemorial sacrifice of the individual to the good of the whole, that it is the very foundation of all the higher life, has attained an understanding that will appeal not only to his reason, but to his emotions as well. If he is so fortunate as to go yet further and to comprehend in his view the majestic spectacle of the ongoing of life, of which the individual is but a noble incident, he will have at least the comfort which comes from the addition of dignity to grief.

Though the enlargement of understanding as to the place of death in the plan which science affords may do something to diminish the personal bitterness of sorrow, it may in another way add to it. As is at once seen, nearly all the deaths that occur, certainly ninety-nine per cent of the whole number, are to be reckoned as accidental and, in a strict sense, unnecessary at the time when the end comes. They are really disasters which should be avoidable, and doubtless in time will be avoided. It is true that in the lower life, where the improvement of the species is brought about by exposing large numbers of each kind to the chance of death, the resulting selection served to advance the grade of the being. Even there, however, there is a distinct recognition of a dumb sort that this waste is an evil; for at each stage of the advance we find the progeny lessened in number until, in the higher of our brute kindred, even twins are unusual, there being commonly only one at a birth, as in man. In place of the thousands, sometimes hundreds of thousands, of young which may come from one mother in the lower species in order that at most two may attain maturity, we have a fecundity which in the higher mammals average less than a score.

This reduction in the sacrifice rate in the higher brutes is a concomitant of the increasing care that the parents and the herd can give the young. So far as it goes it marks the replacement of the ancient formal mechanical methods of control by those which come from the sympathies. Although at every step of the process the range and effectiveness of mere selection is lessened, the advance of life is in no wise diminished. On the contrary, the heightened powers of the mind appear to send it upward with greater speed than it attained before. Thus, even in the brutes, we see the beginning of the new dispensation in which the higher law of sympathy is to take the place of the lower automatic control, which was fit enough where it gave no pain.

When we come to the primitive estate of man we find that the number of the young is still further reduced from its average among the higher *Mammalia.* Though variable, the average is probably not over half a dozen. Moreover, the influence of natural selection, which has been long diminishing, still further lessens with the increased parental and social care. Something of the rude work of the survival of the fittest holds on in the savage tribe. There is indeed a painful remnant of it in the highest civilization, but it evidently ceases to have value in shaping the destinies of the kind. It remains as a mere remnant, little more serviceable than many parts of our body—such as the vermiform appendix of the cæcum—fit only to be the seat of disease, and a way to unprofitable, because untimely, death.

Thus, from the point of view of the naturalist as well as from that of the moral economist, premature death is to be regarded as a great evil, as the sorest tax from which man suffers in his present state—the sorer for the fact that, unlike death, at the end of the appointed time, it is remediable: in large measure at once, almost, though not perhaps in its entirety, in the foreseeable future.

There are those who will doubt the probability of much reducing the death rate, and others who for various reasons will question the advantage of changing the present conditions. As for the doubt of our ability to diminish the present hideous waste of youthful lives, we have only to look to the difference in the longevity of different families and classes of any society. Or, going further, to the domesticated animals, we may note how with appropriate care the young of our cattle and horses are so free from danger of death before maturity that the owner has hardly to reckon on loss in this time. For all the care man has had he has never begun to attain the effective longevity of his domesticated animals. He sorely needs a herdsman's care. It is evident that he can not have it from without; it is unreasonable to suppose that the reproduction of his species among its higher members can ever be brought under the control of a master, as it is in the case of our cattle. The care must come from the understanding and the higher conscience of the individual, from a personal care that looks far beyond the present to the good of generations yet to be. We need a form of the moral sense, based on what our modern knowledge of inheritance has given us—a sense that to bring a human being into the world without a fair assurance that it may have a sound body and mind is a crime. As to those who are too low in nature to feel and obey this motive, society has the same rights that it has with other malefactors, the right to prevent those actions which are destructive to the higher interests.

We can not afford here to concern ourselves with the means whereby the blood of our societies may be purified so that the vast part of premature death which is due to pollution may be avoided, nor can we consider the better hygienic control which experience has shown can do so much to stamp out maladies which once were allowed to go unhindered on their ways. It may, however, be said that even in this beginning of the noble service of preventive medicine a perfectly controlled community could be at once protected from nearly all those noninherited diseases which ravage mankind. If such a community were made up of families free from the tendency to a certain limited number of diseases, there is no reason why nearly all its members should not attain to old age. There is no other field for the exercise of a wise philanthropy so good as this, no other cause so deserving of help as this, which looks to the lessening of the greatest burdens our kind has to bear.

There is another side of the evil of premature death which, though well known, is too often overlooked. This is the vast economic loss which it entails. It is easily seen that the most expensive product of society is its youth. If we take the youths of twenty in any association and reckon their cost in terms of labour alone, we shall find that by far the greater part of the earnings of the people has gone to their rearing. It is likely, indeed, if we could reckon in addition to this investment the contingent value of their lives in terms of mere money, the total would far exceed that of all the capital of all sorts which has been accumulated by centuries of labour. Yet of this precious product of our societies we lose by avoidable death far more than one half, pay it as a tax on our stupidity, ignorance, or lack of organizing capacity.

Those who contend against the view that premature death is the exceeding evil which I hold it to be, may contend that it has advantages in that it in a way maintains something of the good of the old selective processes: that when it comes in war it affords inspiring examples of self-devotion; and, further, that there is no effective way in which its ravages can be diminished without an interference with the rights of the individual such as would entail even greater evils than those we sought to remove. In a word, that we better suffer and sorrow on, getting what light we can from above, until in some way we attain to a new dispensation. Sorrow and suffering has been the lot of man from the time he came to see into the deeps. He has grown by his trials, he has yet to profit by them.

So far as the plea of the *laissez aller* philosophers has a foundation, it rests in the legitimate assumption that man has not yet escaped from the state where the control of his destinies was in the hands of the ancient brutal forces. The contention that the selective processes are of value in society is true only so far as sympathetic rational care has not replaced them. No doubt many weaklings die in youth to the profit of the race. Probably a greater number, who would perish were the process of selection in full activity, survive to breed their infirmities. It should be obvious that we can not expect to have in the same society, working coincidently, the ancient selective action and the sympathetic motives which had gone far to displace it even in the higher brutes. Clearly the part of man is to do his work in the way of his kind, rationally, with the large understanding with which he has been blessed. It is not for him to leave any part of his task to the control of the laws that have ceased to work for him, or can no longer fitly help in his task.

The idea that the death of the young under any circumstances can be other than calamitous, that it should not be fought against by all the agents that we can bring to bear, finds its only real support among those who hold to the notion that war is a help to the better motives of man. Their contentions are that the trials of the march and battle develop the qualities of self-devotion, obedience, and valour in a way that no other kind of activity can accomplish, and that the price that we pay for these gains in the occasional sacrifice of numbers of our youth, though to be deplored, is no more than we should be willing to give for the precious return. They indignantly ask of those who are for peace whether they are willing to purchase it at the cost of all the hardy virtues and noble devotions which uplift our race, and which indeed make life really worth living.

The error of these unobservant persons is one familiar to all those who have to do with the history of inquiry in any field. It is due to the common mistake of supposing that the qualities displayed in an action are derived from the action itself, when, in fact, they are only exhibited and not at all created in the particular activity. A man does not derive the muscular strength he may use in battle from the fight; he has probably gained it in some kind of profitable labour. His courage, his obedience, his endurance in the trials of a campaign are not bred in it; they are the product of his whole life and that of his ancestors, who gave him his nature and nurture. Men must have in them all the qualities that go to make the soldier before they approach the business of war. All that discipline does is to give a certain mechanical readiness for duty; it makes practically nothing of the soldierly quality.

Those who doubt the statements just made should look over the history of European states. They would see that the most soldierly people of that continent are the Swiss, who for a hundred years have hardly felt the touch of war. Yet judges of what makes the fighting man feel that at any moment they would give an admirable account of themselves. Their martial nature, born of national independence and hard, patient labour, with a simple military training to give it embodiment is enough to deter the greedy folk about them from disturbing their repose. Just beside Switzerland, that has bred its soldiers in enduring peace, we see the French, a folk of endless warring, where hardly a generation in a thousand years but has known campaigns. We hear from them the martial note in their worship of arms and the glory that arms may win; in their trust to the test of battle for the decision of all important personal and national matters. Surely if a people gain in the higher qualities by the uses of war, we should find the profit here: for rarely if ever before in the history of man has there been so admirable a chance for this schooling to do its work. What do we find as the result of this age-long process of developing the higher virtues: courage, high-mindedness, patriotic self-devotion, the things for which we pay with the lives of our best youth? No answer need be made to the inquiry. Look at the other so-called Latin peoples. They are the product of a militarism such as northern Europe did not know until relatively modern times, and which our own English-speaking people have never been subjected to. What we find there confirms the judgment that, so far from developing in a people the qualities of the soldier, the military habit in some way hinders the growth of those qualities. The way in which it does it is plain.

In noting the fact that natural selection, because of the enlarged sympathies and the effective help they afford to men, has almost ceased to act in human society, the reservation should have been made that in returning to the primitive conditions of war man once again encounters those conditions which act there in a peculiar and most effective way. For military service we necessarily take from our society the best of its young men, the able-bodied and the able-minded of their generation. The chance is great that they fall in battle, it is even more probable that they die of diseases from which they would have been protected if they remained within the shelter of their civilization. Just so far as this business of war goes, whether it be a thousand lives or a million that are taken from the folk, the result is the impoverishment of the nation's blood. In another generation there will perhaps be no fewer people, for all the losses that war has inflicted, but the quality of the folk will inevitably be lowered. Keep up this process for a few generations and the inevitable result will be the creation of such a decadent folk as we find among the nations who have most amply made the hideous experiment of breeding nobility by sending their best to premature death.

This is hardly the place to extend the consideration of the evils of war to the full extent of the matter, but we can not forbear to note that in the present state of even the best races the proportion of the population that is fit for leadership is small; probably not more than one in fifty of the men have any distinct capacity for guiding in the movements of social or economic advance. Yet in modern war these are the men who must be taken to do its difficult and dangerous tasks. The mere burly soldier will no longer serve for the purpose as he did of old. The result is that society loses its profitable saving remnant. It suffers as would a herd if the master were insane enough to select the best for the butcher.

These considerations point clearly to the conclusion that the fancy that war is necessary to maintain the ideals of manly courage is as mistaken as is the notion that the system of the duel was required to uphold the sense of personal honour. There is good reason to believe that those societies which have abandoned the latter evil custom have gained in the very qualities that it was supposed to foster. There is no room for doubting that a century of absolute peace would find us far better provided with all the so-called military virtues than we would be if we had followed the example of France in our worship of the war motives.

The sparing of woe which would be brought about by the cessation of war can scarcely be imagined. In our civil war over half a million men went down to premature death. This means that some millions of people were stricken. To this day every community bears the impress of that sorrow; it will take half a century to bury that vast burden. Even the trifling conflict between the United States and Spain has meant anguish to a great host on the two sides of the sea. We do not hear this grief, but it is as real as the noisy exultation of the victors; it will outlast their triumph.

Whoever would mitigate the supreme evil of untimely death, whoever would give to this naturally glad world a chance to win its happiness, can not do better service than to contend against war. Let him concede that it is necessary to keep our youths ready to make the supreme sacrifice of life for the good of their people, he can afford to await those seldom occasions when war is fully justified. If we can but spare the evitable wars—those which could be avoided if all decent men saw the measure of the iniquity—the world would be safely enough at peace.

CHAPTER XI

THE RELATION OF SOCIETY TO DEATH

We have already noted certain evident ways in which societies, beginning with those of the lower species and afterward with those of man, have ordered their life with a view to avoiding so much of the evil of death as might by any contrivance be put aside. In fact, the main result of all these associations has been to provide against the ills which arise from the brevity of life of their individual members. Although in organized human societies we have a host of arrangements which are designed to obviate the evils of death, little consideration has been given to the problem as a whole. There has been no effort to organize the various endeavours so that the state should be able to husband its resources of life in the most effective manner. I propose in this chapter to consider what might be done in a society of an ideal form, yet not altogether beyond the limits of reasonable expectation, to attain this end.

Assuming, as we must, that in any well-organized society the normal individuals are to retain the full measure of their freedom, as distinguished from license, which the best existing systems afford, and that the unit of the association is to be the family, the question is, What can we hope, by means of public opinion, or the law, to accomplish in the way of further diminishing the evils that death entails? I place public opinion first among these sources of remedy, for the reason that there alone can we hope to lay the foundations of any such improvements as we would bring about. It is toward this betterment of public opinion as regards the evils of death that we need to make the most strenuous endeavours, for it is just there that we find an assemblage of prejudices and miscomprehensions which go far to block all progress on the way we would go. These obstacles need first to be considered. Though in their nature simple, their importance is such as to demand some analysis. This can be best obtained from a brief history of them.

It is easy to see that the present state of mind of most men as to the place of death is shaped, as is naturally the case, not on any rational consideration of the matter, but on the sympathies. Very few persons have been brought to see that death at the fit time is essential to the great order, that it is beneficent; and that it is death at the unfit time, and the disability that leads to it, which is the evil to be contended against. To most people illness which is out of the normal order is but a matter of course, while death, coming even at the time when it is due, is taken to be a visitation of an inscrutable Providence. To better this opinion we should make it clear what the economic results of premature death and the illness which commonly precedes it really are. It should, as before noted, be made plain to all the generations that the tax which is thus imposed is, from the point of view of money alone, the sorest paid by man. When we consider that, owing to premature death and enfeeblement, we win on the average less than one half the service we have a right to expect from men who attain an adult age, and that only a small proportion of those who are born come to their full promise of usefulness; that quite one tenth of the living in our best-organized societies are, from disability, a burden on the others, it becomes clear that the tax is, in its aggregate, greater than all the others we pay for the privileges of our associations. We are, indeed, so stripped by it that less than half the normal earnings of those who remain in life and health are left to them.

As to the way in which this idea of economic value of life may be borne in on our people it is not easy to prescribe. It may, however, be suggested that it should enter into the teaching concerning the duties and place of the citizen, which has fairly established itself in our schools. At first sight it may seem an unworthy thing to estimate life and health in terms of mere money value. This, too, is but a prejudice derived from a short-sighted way of looking at things, for this measurement is but a direct stating of a loss than can be adequately expressed in no other manner. Properly set forth, this idea of the value of the individual to his associates in action is indeed noble, for it clearly presents the relation of the members of a society to one another. It accentuates the truth that no man is in it for himself, or even for those who know him; that he is in possession of his society, of his state, and of mankind; that with his illness or death all his fellow-men are poorer than they would be if he remained vigorous in the fellowship. In fact, there is no surer way to an extension of the altruistic motives in human society than by the development of this conception as to the economic bond between men.

Next in order, if, indeed, it should not have the first place, is the need of a better knowledge as to the essential interdependence of the generations.

The Occidental state of mind, that which characterizes all the vigorous folk of the world, leads to an exceeding magnification of the individual. He feels it in an excessive and irrational degree of isolation and power to act for himself. He looks neither backward nor forward upon the tide of life of which his personality is but the momentary accident. There can be no question that this intense individuality of the Western Aryan has had great value. It has given us men endowed with rare vigour in action. The time has, however, come for another and wider view as to the true station of the person in the generational chain. Our knowledge as to the facts of organic succession makes it plain that men, while they may well retain all the majestic sense of originating power, need more and more to perceive that their largest function is as trustees of life. They receive the store of gains their predecessors have won; they take with this wealth an obligation to transmit it unimpaired because of their care, and augmented by the additions which they may be able to make to it. When these potent truths become the common property of men, as they surely will, we may expect in the masses, as we now find in the considerate individual of even general knowledge, a sense that man is not here for himself, but that he is a part of a vast order which he is bound to serve; that his individuality has dignity and beauty only in so far as it recognises this order and intelligently shares in the work thereof.

The effect of this view as to the station of the individual human being will be in many ways helpful in bettering the attitude of men toward death. It will elevate their conception as to the place of this event by showing them how it is the sacrifice which we each pay for the good of all, because mortality is the price set on advance in the scale of life. The main gain, however, will most likely come from the increased sense of responsibility to the life of the unborn generations for the effective transmission of the store that has been committed to their keeping. Much of this forethoughtful state of mind has always existed among peoples who have won their way above the most primitive estate; but it has commonly related to public affairs only, to the safety of distinguished institutions, families, or the state. It has rarely been recognised that each is in himself a commonwealth of inconceivable antiquity and endowed with a peculiar dignity. That all the worth which institutions have is but the harvest of individual lives. When men come to see themselves as their natural history portrays them, they will surely judge this duty as transmitters to be the most sacred of their obligations and recognise the seriousness of the command to take account of the good and evil which they may hand on to their successors.

Already we begin to perceive some of the effects of this modern view as to the place of man as a transmitter. It has been my good chance to see, for more than the term which we count as a generation, year by year a great number of youths of the better sort in a way that has shown me much as to their motives. Within this time the gain in the seriousness with which these young men look upon the question of their duty by those who are to come after them has been very evident. Without any abatement in the joyful motive with which youth should always face the world, they are evidently affected by the bettered sense of what their lives may be made to mean. It is on such gains as these that we must hope to found the larger understanding of men as to the place of death and the adjustments of action we should make with reference to it.

In the new conceptions of duty concerning death we may expect to find a clearer sense of the importance of so arranging the life of the individual that the society of which he forms a part may obtain the full value that he has to give. Although the world in a blind kind of a way may be said to be ever on the watch for persons of highly distinguished capacity, there is no recognition of the fact that nearly all persons of sound mind, and some as well who are not so, are, because of the range of their individuality, endowed with ability which might be, but rarely is, turned to profitable account. It is, indeed, one of the greatest evils of the commonplace way of looking at things that we instinctively consider people as all alike, until here and there one appears who is strong enough to prove that he is exceptional. When we come to see that this individual person is the temporary manifestation of an invisible procession which has marched on through the ages; when we recognise that this unique embodiment has never been before and can never be again on this earth, that when it parts from us we lose a combination of qualities which can never be repeated, then we may hope adequately to begin the greatest work of mankind, that of caring for itself in each of its incarnations.

There is another aspect of the relations of society to death which is to be found in the rites and observances concerning the dead. From the earliest condition of man we have the custom of caring for the body of the departed. In fact, this care may be regarded as one of the distinguishing features of our kind. There is no other formal relation to our fellows which is more universal or has been more sanctified, none that has varied so little in the course of our advance from the primitive estate. There is good reason for the steadfastness of this relation, for it is founded on an instinctive sense of the value and permanence of the individual to himself and to his fellows. Whether he believe in the doctrine of a personal conscious immortality or not, no discerning person can doubt that this recognition of the dead is good. Yet he may well protest against certain of the ways in which the dead are made to weigh upon the living.

The most serious of the burdens which our customs require that the living shall bear because of the dead is that of appointed mourning. The passage of the beloved should and always will, while the best part of man survives, arouse sorrow. It should, however, be seen that this sorrow is not in itself good; that it is but a mark of human imperfection. It should not be fostered. The command should be to put it aside, giving all the means that is commonly spent on it to the better care of the living, leaving good memory alone to be the monument of the departed. As it is, there is a prevailing opinion that grief, even when it leads to the disability of the bereaved, is a fit sacrifice to the beloved dead.

There is another evil in the existing customs of society concerning death which leads to an excessive expenditure of money in idly commemorating the departed. There is in every heart a natural desire to be remembered. To most people the inevitable forgetfulness which comes quickly to all save the rarer men seems a large part of the curse that death is to bring to them. Even the best of us, when we examine the sources of our satisfaction, find that they in large part consist in the notice that others take of our presence in the world. If we play the hermit, there is most likely the satisfaction that as hermit we are noteworthy by our absence from the throng. So when we think of forgetfulness on our own part or that of those we love we shrink from it in a good and natural way. There are, indeed, few sides of our many-faced human quality more pathetically noble than this. But, like much else of our good qualities, it is not yet in its best showing. We do well to have our dead or ourselves commemorated; but we do not seek the perpetuation in the fit way when we display a mere name on a monument, however much a work of art it may be. The essential quality of a human being is in its activities, and not in its name, or even in its mere form. Yet we persist at a vast expense in recording these features of the dead. In many communities the cost of funeral monuments much exceeds what is spent on schoolhouses. There are no trustworthy statistics on this matter, but from somewhat careful observations made at three widely separated points in this country, I have been led to the conclusion that the cost of unnecessary and generally reprehensible monuments to the dead considerably exceeds that of all the investments of our educational system.

A proper understanding of the nature of an individual man makes it clear that the only suitable monument is some beneficent action done in his name. All of his quality while living—that, indeed, which made him alive—depended on his actions, the effective part of them, in relation to his fellow-beings. All that by any possibility can endure on this earth are his fruitful deeds. If he has been a profitable member of the brotherhood, his influence will flow right on in the stream of endeavour in which his drop has been merged—the stream which nourishes all life. If we should seek for our beloved, or for ourselves, some shadow of a place among men after the time of going, the only fit way to do so is by well-continued activities or institutions which we may set in motion, such as men may see to be good and judge therefrom of those thus commemorated. The variety of these monumental activities is great. There are any number of little beneficences which would cost less than the average monuments in our cemeteries, yet would serve to enrich our communities. A shapely drinking place by the wayside, a seat that commands a pleasing landscape, cost but little more than the cheapest of the vain headstones that mark the place of the dust. A bit of park ground or a scholarship in a school are less expensive than any one of a thousand monuments such as vainly seek to attest the virtues of the dead in our great burial places. A wise use of the money expended in a single cemetery well known to me would enrich the community in which it lies with scores of precious institutions, making it the wealthiest in resources for the helping of man of any society the world has ever known.

Even for the sorry purpose of mere fame this sacrifice of wealth upon the grave is futile: it gives, at most, the bare letters of a name. To persons of true culture it is as hateful as the simple burial places of earlier times with their plain tablets are pleasing. A mile or so beyond the cemetery where the wealth of a great city has been lavished in competition for a vain notice of its dead, there is a little field dotted over with the slate headstones such as were in use in the earlier centuries. In proportion to the number who rest in these neighbouring fields the cost is perhaps as a hundred to one. So, too, is the pleasure of the discerning eye, but the advantage is with the unaffected, ancient place.

When society comes to understand itself as the present order of man; when it sees that the individuals which compose it are but the temporary incarnations of the spirit of the kind—as individuals infinitely important, yet to the stream only as the drops that melt into it—we may hope to see an end of this clamorous endeavour to gain a brief memory where forgetfulness is inevitable. When this stage of thought is attained in the associations of men we may reckon on a truer estimate of the place of the person in this world.

A proper understanding of the problem of our individuality in relation to society—to our race—shows us that we should give up the impossible and delusive ambition to be known of all men, and limit our desires of this sort to the true fellows of our life, those who march near us in the great procession. This view, however, is but the counterpart of the other understanding, that our individual lives are but as heart beats of the greater body of life, for the sake of which we came to be, and for the sake of which we are to pass away. Our share of the life of this whole is as real as though it be other than that we have with our comrades. In the personal life it is a happy immediate interchange with the kinsman. In the race life it is pure devotion where we may fitly seek no recognition, for such can not be given us.

CHAPTER XII

RELATION OF PARENT TO CHILD

The question may well be asked as to the extent to which the new doctrine concerning the nature of individuality enforced by modern science is to affect our view of kinship to those with whom we are nearly related in blood. It is evident that at present the principal moral bond of our families and much of the beliefs that unite men of allied races rest upon the assumption that the child is essentially a reincarnation of the parent, and that the likeness between the members of the same race, even where consanguinity can not be proved, is relatively close. If we are to adopt the view that the individual of our kind is the embodiment of the successes achieved in an inconceivably numerous ancestry, of which probably not the hundred-thousandth part had attained the form of man, can we continue to attach any considerable value to relationships that of old appeared to be supremely important? If, in a word, our child owes to our individually acquired quality perhaps not more than the millionth part of what it possesses, and has to credit the rest of the sum to a series of ancestors extending back to the dawn of life, is there any substantial basis for believing it to be our child in any full sense of the word?

Before answering the above-noted question it may be well to consider that the ancient view as to the bodily and spiritual relations between parent and child has evidently been long undergoing a change which has distinctly altered the import of the bond. Among the ancient Hebrews we find men longing for children with a feeling that in them they were in an actual way to live again. The early literature of our own race is full of allusions that show a like though less intense form of the same motive. In our own day we rarely catch this note. It seems as if the widening of the love of our kind had lessened the olden longing for issue. There are reasons for believing that the new view as to the conditions of inheritance is not likely further to diminish the sense of our identification with our kindred; it may, indeed, rather serve to enhance it. These reasons may be briefly stated as follows:

While it is true that if we could analyze the vast body of anatomical, physiological, and mental parts and qualities that go to make up a man, we should very likely find that while not the ten-millionth of the whole was due to the individual life of his immediate parents, that part of the life which was transmitted at birth, it by no means follows that the relative value of the parental and remoter contributions is in anything like this disproportion. If we could make the fancied analysis, we certainly should find that the greater part of what we are is determined by the laws and conditions of the inorganic materials which are the basis of our frames. Of the organic results achieved in our bodies practically all were shaped and sealed in their form before man was. All that has been won to our bodily part by all the generations of our species is a few details of proportion and hue, together with some lesser peculiarities, such as the shape and distribution of the hair. It is in the intellectual parts that the experience of the human progenitors has had determining value. The primitive emotions, such as hate, fear, greed, etc., were shaped in the life below mankind. It is probable that the æsthetic motive took its form in the prehuman stages of our development. But the reasoning power in man has so greatly qualified these motives that they in character widely differ from that which existed in the lower realm. Thus, while there is a real basis of sympathy between man and the lower animals—one that grows firmer as we ascend in the scale of being—within our own species the kinship of the individuals as measured by the identities of the common nature is vastly nearer than with any of the lower animals. The nearness of men to one another is not exaggerated by any of the phrases that are commonly applied to it: in truth, we lack words wherewith to set forth the full measure of the bond which links the most widely parted men to one another. Between their species and the nearest of the brutes there is an interval fit to be compared with the spaces between the planets. There can be no doubt that modern science has strengthened the bond that links men together and effectively separated them as regards intellectual kinship from the brutes.

The bond that links all men together is the stronger the nearer they are to one another in the generational succession, for with each step in that approach the likeness of Nature on which sympathy rests is enhanced. The men of our own race properly claim our affection in larger measure than those of other races, for the reason that we instinctively comprehend them as we can not those of alien blood and motive. The fellow-citizens of our commonwealth, if they be really such, are closer to us than our kindred beyond the seas, because of the social and political motives we share with them. Our cousins and other recognised members of our families are nearer yet, for the links of common and dear memories. The closest of all these relations, because it brings with it by far the surest basis of sympathetic understanding, is that which ties parent to child, or brothers and sisters to one another.

So far as the inheritances of the body are concerned, our modern science clearly tends to break down the ancient notion as to the relations of men to their progeny. We now see that our successors take their shape in a measurably small share from ourselves. Of the qualities due to the personal activities of their progenitors they probably receive nothing whatever. As regards the mental capacities of their immediate ancestors, which depend upon culture and accomplishment, it is likely that nothing is passed on. A child is therefore vastly more the offspring of its race, or rather, we should say, of its realm, than of those individuals to whom it immediately owes its life. That this statement is true is endlessly shown us by the failure of great men to transmit their qualities to their children. There are, it is true, families that send us from generation to generation a measure of strength that appears to inhere in their stock; but it is most rare that this stream of power flows in identical channels. In the light of our knowledge concerning the nature of inheritance we can see why this should be as it is, for each child combines in itself the hosts of tendencies that exist in each of its parents, and the equation of these inconceivably numerous factors could only by the rarest chance be such as to make the child perfectly resemble either parent. The same conditions which in the formation of the body lead to the endless diversification of its shape in like manner lead to an equal or greater diversification of the mind. It is, in a word, clear that nearly all of what is transmitted from ourselves to our offspring comes from that common store of life upon which all our race or gens draws for its share of good or ill.

At first sight the fact that our descendants take by process of birth so little of the qualities which we recognise as most clearly our own, appears greatly to limit the conception of our kinship with them and our responsibility for their conduct. This is, however, a mistaken view of the situation, as will appear on a little examination of the matter. It is evident that every child of birth is a blending of the host of impulses which, revealed or hidden, existed in its parents. What was separately in their persons is in union and interaction in his own. By far the greater part of these inheritances are organic, and as such quite beyond the limited field of consciousness. From the interaction of the parental transmissions the new life is shaped. So far as these inheritances lie in the organic field they can be but little influenced by the action of the parent: yet certain diseases acquired by them may be transmitted directly or in consequent maladies to their children. Various conditions of body due to good or bad habits may vitally affect the physical state of the offspring. It appears, for instance, quite probable that a predisposition to drunkenness curses the children of an inebriate, and that it is due in some measure to the indulgence of the parent in that vice. It is not necessary to extend these considerations, for it is evident that in many ways the actions of the parent may serve their progeny for good or ill.

Our information concerning heredity does not enable us to fix with any certainty the bounds of the effect of parental habits on the offspring. It is, however, certain that any habits injurious to the body or the mind act to lower the quality of the offspring, to lessen its share of the race store, and most likely to give it a tendency to the same evil doing. If there were no other reason save that we are the keepers of this ancestral quality which goes on through us to our descendants, we would still have a foundation for feeling that they are peculiarly our own. But this is only a small part of the basis on which rests our love for our children or theirs for us: a greater is to be found in the understanding that in our child there are united two streams of tendencies, one dear to us because it is personally our own, and another that should be no less dear because it is derived from the chosen companion. Because of our scant knowledge of heredity we can not yet win what our successors surely will from this modern conception of the parental relation. Still, this double kinship, even in the simple and limited ways in which men of all kinds have understood it, is a most real basis for parental affection.

The surest foundation on which the love of parent for child can rest is that which comes from the care that is devoted to its education. Men are by nature care-takers, and all they give of devotion, even to inanimate things, brings with it a rewarding movement of the sympathies. Much of this sympathetic movement will be aroused even if the child cared for is bound to us by no more than the common bond of humanity, so that childless people do well to rear the children of others. It is, however, only when the infant is our own, when we know that all its motives have been a part of our individuality or of the other whom we have adopted into our life, that the affection attains its perfect form. Then our help is most effective, for it is given with ample knowledge drawn from our own experience. We, then, are in a way living our lives over again with our better selves for a mentor. We are thus in the most godlike situation which the world affords—that in which intelligence seeks to mould its own image. Something of this admirable relation between mature persons and the young inheres in all educational work, but its perfection is found only in that part of the task which the parent alone can perform.

It is quite evident that a mother who had never seen her child would, on beholding it, be moved by no motherly impulse; all the forthgoing of her spirit depends on the care she has taken of her offspring—on the love that came of that care. The child is beloved, not because it is of her body, but because she has made it of her soul. We thus see that while there is a marvellous organic relation between the generations, the union is not of a kind on which the sympathies are directly founded, for the reason that the relation is in a way mechanical. It does not intimately concern our sympathies; their movement depends upon the unison which care-taking affection develops. The value of the connection between parent and child consists in the opportunities it gives for a complete presentation of one being to another so that the identity in quality is intimately felt.

Marital affection may be very strong because in it the appreciation of the other individuality is keen, but it lacks the perspective which is gained by the study we give to the growing child. The memory of our child combines a very numerous succession of impressions, each relating to some stage of its growth; in each of which we have in a way a share. We thus by reiterated experiences attain a deeper, firmer, and more varied basis of sympathy than is won from any other mode of human intercourse.

If, as above maintained, the love for our children is due not to the organic bond alone, or even mainly, but in larger part to the mutual education in sympathy which the relation brings about, it is clear that the new learning, so far from in any way lessening that love, is sure to increase its range in scope. If men depended alone for their love of their offspring on the instinctive affection which they inherit from the lower life, there might be some reason to fear that an understanding of the limits and conditions of heredity would weaken the bond between parent and child; but as this union has in our kind come to be mainly the result of the educative relation, it necessarily and naturally tends to increase as the demand for education advances. Among ancient men the amount of help the child received was far less than in our day. Even among the cultivated people of antiquity the youth at puberty was very generally reckoned to be beyond the need of parental care, though commonly under parental authority;

the family, in the better modern sense of the word, was relatively undeveloped. In our day the relation between parent and child is evidently undergoing a profound though unrecognised readjustment. The effect of this change will evidently be to establish a better union than has existed before—one that rests not on the idea that our children are our own, because they have sprung from us, but rather because we have by sympathetic education drawn them into mutual understanding.

All that has been here said concerning parental love applies equally well to that which the child owes to its parents; it applies indeed to all the affection that is due from one kinsman to another, of whatever degree. The reason why this greater measure of sympathy is due to kindred and why it will ever be given, is that among them, and in proportion to the nearness of the relation, a common basis of motive and understanding may be reckoned on. All sympathetic intercourse evidently depends upon the existence of discoverable identities; the more numerous these are the greater and more authoritative the demand the fellow-being makes upon us. This demand should be heeded from however far away it comes: it is most imperative when it is heard from our children, because of all this world we can best understand their cry.

CHAPTER XIII

THE PERIOD OF OLD AGE

In all the lower vertebrates, and in some measure in the invertebrates as well, the close of life, except it end by accident, is preceded by a period of decay. Professor Hyatt and others have shown by extended studies of the matter that the phenomena of old age occur in the higher *Mollusca* as well as in other invertebrates, and that it is marked not only in the individuals but in the specific and other groups to which they belong. As this is a large question, one which would lead us far if we undertook to give it any extended discussion, we will note only that the fact of decadence as a concomitant of organic advance is pretty generally accepted by well-informed naturalists, and that it applies to groups of organic forms as well as to their individual members. We see how the gens, the tribe, the species, the genus, as well as the more inclusive groups, each in turn become crippled and perish. It appears, indeed, as if these branches of the tree of life, as well as the individual buds, were required to drop away in order that new limbs might come forth. All this is in accord with what we have noted concerning the conditions under which the organic world may perfect its education. We have seen that any continuance of the person after its service had been rendered was avoided. When their contribution was made they were fitted to pass away.

In the lower animals, because their contribution to the life of their kind is almost altogether connected with reproduction and the rearing of the young, the end is appropriate as soon as this stage in their work is finished. It is therefore almost a matter of course that the period intervening between the end of the reproductive term and death should be, as we find it, brief; so brief, in fact, that it is of no consequence. In our domesticated animals there can hardly be said to be a normal old-age period after the time of bearing young is passed. So far as I have been able to learn, there is nothing like the grand climacteric among these creatures. In mankind it is otherwise: in the fifth decade, at a point where rather less than half the normal longevity has been attained, the breeding time of the female is definitely over. Among the males the reproductive function normally continues for some years longer, but it may be assumed that, generally soon after the sixtieth year, this part of the life work of most human beings is done. Yet, as we have seen, there is what may be called a physiological expectation of a further life of some forty or more years.

How far the long period of normal senectitude in man is due to the peculiar care which civilization and even a decent barbarism devotes to elderly people, and how far it is due to some peculiar development of the organic motives in the species, it is not easy to determine. It is indeed most likely that both these influences contribute to the institution. The fact that the reproductive period of the female in man lasts only about thirty years, or less than one and a third times the period required for the full growth of the body, leads to the presumption that a change has come in man which leads to the establishment of an old age period. In all the other species of the mammals which are, in this regard, well known to us, the gestation period normally extends to three times or more the term of growth. Thus, mares which are grown at five or six may bear young from their second until after their twentieth year. Something like this proportion is true of all our domesticated mammals. It is therefore evident that the limitation of child-bearing is a very novel feature in the mammalian series.

So far as I have been able to ascertain, the variation among different races of mankind, in the period when child-bearing ceases, is not great. It is probably less than the range in the term of adolescence or the time of puberty. It is thus evident that it is no new occurrence in mankind. It must have been established before the division of the species into the several existing races took place. It may well have been brought about in some form that was prehuman. It may, for all we know, exist among the anthropoid apes, for concerning these interesting species we know scarcely more than their anatomy, which tells us little as to their physiological relations to our kind.

It is hardly to be supposed that the shortening of the gestative term could have been in any way due to the process of natural selection. It is indeed evident that there could have been no such gain to the individuals as would serve to perpetuate those varieties which come to have the shortened term. It is difficult to see where the profit could have been to the species which possessed the peculiarity, for its result is considerably to limit the number of the progeny, making man the least fecund of mammals, and thus to bring to the species a state of weakness rather than of strength. Probably a skilful special pleader of the cause would find some conceivable way in which the facts could be reconciled with the principle of the survival of the fittest; but in the direct reading of them we see only an innovation which could have been of no particular account in any species before the human estate or even to the savage man, but which fits exceedingly well into the scheme of our higher societies.

While, in the species of animals below the level of man, we find occasional instances of survival to the period of old age, such individuals are but a burden to themselves as well as to their kind. They take food which is never too plenty; they cumber the herd which has for its important function to reproduce as rapidly and effectively as possible and to get onward by selection, or otherwise, as speedily as it may. But, with the beginning of speech and the varied enlargements that come therewith, all the relations of the individual to the company in which it dwelt underwent a great and ennobling change. In place of being a mere apparatus for increasing the numbers of the herd, and perhaps for its defence, the individual becomes a storehouse of acquired or traditional knowledge. It gains in wisdom which now, for the first time, comes to have a distinct place and value in the organic association. Such intellectual gains are, in general, the greater as life goes on to the verge of the exhaustion of the vital powers. It is in this way that the shortening of the reproductive period, or rather the prolongation of life beyond its term, becomes of value to man.

We find an effective recognition of the value of the aged members of the society as we advance from the lower animals, through the savage tribes, the barbarians, and so up to civilized man. Among the brutes, even the gentlest, the superannuated are either quite neglected or, as is often the case, killed or driven from the association. In some cases it appears as if with the cessation of the reproductive powers the creatures were no longer instinctively regarded as members of the species, but as aliens. Among the lowest savages like conditions prevail. No care is taken of the old members of the tribe. In some of them they are slain as soon as they become too enfeebled to take an effective part in the rude duties of the society. As we rise in the scale of civilization to where there are traditions to keep and grave councils to be held, to what we may term the barbaric plane, we find at once a distinct value is set upon the old people. They begin to receive care and in time reverence from the younger generation. There is probably no better simple test as to the separation between the mere savage and the men of a distinctly higher estate, however savage-like he may at first sight appear, than this difference in the treatment of the aged folk, for much of importance goes with it. It is a noticeable feature in the early sacred writings of the Jews that, while they represent a very primitive condition of society, so far at least as its impedimenta go, they are full of reverence for age. In general, it may be said that when the people begin to have a literature or a body of traditions formed into an organized religion, the aged comes to have a high place in its society, a separate but dignified position.

As civilization advances to near its present state another change comes over the treatment of old people. They are no longer regarded as a folk to be set apart from the active members of the society to be looked up to as a class with a certain reverence and an obligation to maintain a fitting dignified and solemn demeanour. They are, as it were, readopted into the association and are allowed to go along with the business of life in the manner of other men and women. This change of temper is probably due, in part at least, to the fact that modern skill, in the care of the body, has done a great deal to remedy the defects that age brings, especially those of the eyes and teeth, so that those of fourscore can still appear as and do the work of younger men. The generation which has seen an aged Gladstone guide an empire; a Von Moltke at the threescore limit beat down France; and a Bismarck, at more than threescore, readjusting the.powers of Europe, has naturally enough given up the notion that a seat by the chimneyside was the only place for the elders.

There is no reason to doubt that the present attitude of society toward old people is one that is greatly to the advantage alike to old, mature, and young. It brings into the centre of the social life all the value which inheres in age: the broad view of life, the repose, the sense of relative values which is lacking in the immature and scarcely attainable by those who are in the full tide of living. The change is indeed the complement of the introduction of the youth into the social relations of their people which has also come about in our time. It marks the modern passage from the earlier division of men into ranks and occupations in which women, youths, and the old were separated from the active and militant class. The ancient system was bred of the military spirit in conditions where the fighting quality was of the utmost importance to a people; when all the conceptions of human relations were affected by considerations of war. The relative security of modern states has permitted a new classification, or rather a destruction of the old, which leaves human beings to find places determined by their qualities. It is this readjustment which has served to better the position of the aged by keeping them in closer relation with their fellows.

It is also evident that the value of aged people in society has risen with the development of the industrial side of our civilization. The ancient custom of putting them to death, though rude, was, in a way, justifiable in a stage of society where there was nothing to spare, and where the maintenance of the aged meant insufficient food and raiment for the young. The growth of wealth means, among other things, that the society which possesses it has become able to pay for other than immediate bodily needs; it can and will support much that its ancestors of remote degree in no wise valued; it can afford to pay largely for all that makes for the spiritual and intellectual environment of its life. There is no doubt that the presence of three or four generations in one social edifice gives to it far more value than is afforded by one or two. The elders are, it is true, of the past. They are relatively inactive; they contribute little to the direct profit of the association, but they serve, as nothing else can, to unite the life of the community, to bridge the gap between the successive generations.

It is easy to see that as the body of the tradition, which makes the spirit of a people, becomes the greater, it is the more difficult to effect the transmission of it, from stage to stage, in the succession. Notwithstanding the vast resources of our printed records, they do not completely convey the quality of one time to that which succeeds it. As the spirit of society, that vast entanglement of blended emotions and understandings, grows more complicated and of greater value to those who live in and by it, the difficulty of this transmission increases and with it the risk that much that should go on is lost in the passage. Thus, to take a new and striking instance of such failure of the past experience to be transmitted, we see in the outbreak of the late war with Spain, as well as in the campaigns to which it led, how imperfectly the traditions of one generation are passed to that which succeeds. Of no war has the record been so complete and apparently indelible as that of 1861–'65; but for all that, the new generation lacked the true sense of what conflict with arms meant. It went about it light-heartedly, to be stricken with horror when they found that it meant suffering and death. If the declaration of war could have been left to those men and women who had a knowledge of its real nature, it probably would not have been undertaken.

The same difficulty in transmitting experience by any record is shown in the management of the recent land campaigns. On the face of the matter it would seem that there is no part of the acquisitions of man that could be so well transmitted as those which pertain to military duty. Every step is well recorded; there is an elaborate framework to hand on all that has been learned. Yet we see officers of more than common intelligence utterly neglecting the very first duty of the commander, allowing their men to lack the simplest and perish from want of the most ordinary precautions. All doubtless tried to do their duty by their trusts, but the only admirable successes in difficult tasks appear to have been on the part of the elderly men who brought to the work the experience gained in the time of another generation. If we had lacked what we had of the men of threescore, of men who, a century or two ago, would have been regarded as superannuated, the result to our cause would doubtless have been quite other than it was.

Considerations such as those which have just been presented could be indefinitely multiplied, not only in relation to the matters of war, but in those of peace as well. They are marked in the repetition of political follies and the successions of commercial disasters. They all show the need of adding, in every possible way, to the strength of the bond between the generations, so that the life of our societies may thereby gain a larger unit of action than is afforded by the experience of its most active members. If we could make the deeds of any one time result from the consensus of three or four generations of experienced men, we might hope to gain an element of steadiness in the development and in the working of our institutions which would be of great value to civilization. There would be fewer recitals of failure; fewer of those reversions toward savagery which set back progress. The machinery of civilization would move with greater steadiness and safety.

There are three ways in which we may hope for the betterment of our means of passing on the valuable acquisitions of society. It may, in part, be done by the improvement of the kind, by separating the savage and brutal stocks from the better class, so that degraded strains may not reproduce. To the naturalist this appears the most obvious means of gain, for the bettered life which would soon be thus won would be quicker to respond to all good influences. As yet society is not ready to adopt this simple and essentially humane method of bettering its estate. It prefers to punish the brutes who successively appear rather than to prevent their succession. The second way is by making our historic record more effective, not only more complete as regards its matter, but more perfect as regards the lessons it conveys. Something may be done in this way, but those who most need the profit of history can not be expected to obtain it. Moreover, it has commonly to be written by men who are parted from the spirit of the times they chronicle. The only effective way of bridging the gulf is by keeping in the life of the active generation as many representatives as possible of those who have gone before; retaining them not as relicts but as active sources of knowledge and sympathy.

It may be said that the endeavour to help society to a better understanding of its past by extending the life of as many of its members as possible is, for several reasons, in vain. In the first place, it may be urged that the proportion of those who may live on beyond the active period is so limited that they would not have a sensible influence on affairs, and that when they survive beyond the usual limit they are, because of their many infirmities, of no value to the social system. The answer is that, even in the present imperfect state of our care for life, some do survive to the tenth decade with much of their original quality in them, and that, as our experience with domesticated animals shows, whereunto any one member of a kind attains, all may, with patient care, be brought. There is no physiological reason why the expectation of life at birth should not be, in the course of time, brought somewhere nearer to the fivescore years to which some few survive. It is, furthermore, asserted that, after an age of about seventy years, the enfeeblement of mind consequent on the general decay of the body makes the value of the individual very small. Here, again, the answer is the men themselves—exceptional men, it is true, but within the possibilities of culture to make normal men who have in the ninth decade done good work in varied fields. Humboldt's Cosmos, the second part of Goethe's Faust, and many other monumental works in various branches of literature, serve to prove the possible integrity of the faculties in advanced age.

It may be well again to note that the endeavour to retain the aged is not an effort to preserve the lives of the old alone. It is but a part of the larger duty of avoiding premature death at all stages in the history of the individual. The present waste of endeavour and of promise which comes with the loss of men and women before society has had the value which they might have yielded is a grievous and a shameful thing. We pride ourselves on the economic successes of our civilization, but give no attention to the fact that as regards the most precious things with which we have to deal, the lives that are in our care, we are utterly wasteful; doing our work in a way that would bring a mill owner to disgrace in the estimation of his fellows. We have as yet devised no method whereby these lives may come to us in a wholesome condition. Our means for caring for them after they are with us are entirely inadequate for the needs. The result is that only a small fraction of the value which should be harvested from a generation is really won to use. Every step which is taken in the ways of remedying this evil will help to increase the share of the able-bodied and able-minded aged, who remain to enrich our civilization.

It is an interesting question whether, in the future, anything can be done to extend the term of life beyond the limit of about a century, at which it appears now to be fixed. It is probably far too soon to come to a conclusion on this point, for we lack accurate knowledge of nearly all the data required for the inquiry. There are, however, certain indexes which have value; they may briefly be set forth. A study of longevity as it is displayed throughout the animal kingdom shows us that it varies much and often rather quickly in relation to the conditions of the environment. As before remarked, in plants and animals alike it may in this regard greatly differ in two rather closely related species. Therefore, we may conclude that while the system of the organic world calls for an essentially brief duration of the individual, it allows a considerable range in the length of the life period—considerable in the sense in which time is reckoned by us. It is also to be noted that since the coming of man, or at least not far back in his ancestry, there appears to have been a sudden loss of longevity measured in terms of the period of growth. If this really occurred, it may be that the term is less fixed than we would expect it to be if the institution were of more ancient date. Last of all, while the upper limit appears, at least at present, to be somewhat rigidly established, the variation in the endurance to the tax of life in different families is marked, which seems to show that there is in this regard a certain elasticity in the position of the limit.

CHAPTER XIV

THE UTILIZATION OF OLD AGE

THE question before us is as to what we may do to enlarge the meaning of old age, either by increasing the proportion of those who attain to it or by making that part of the lifetime to those to whom it comes, more fruitful to the community. Although there have been many incidental studies of longevity in man, there has as yet been no sufficient inquiry into the condition which determines the survival of the individual in a state of sound body and mind beyond the average period of life. There have been more or less probable conjectures that this or that personal habit, condition of society or of climate are influential in extending or diminishing the length of life. But, so far, none of these working hypotheses, if such they may be called, have been verified. The only fact that appears to be fairly well established is that the tendency to live to a considerable age is like most other organic tendencies, a matter of inheritance; it being decidedly more common in certain families or strains of blood than in others. Yet even this is but a general truth to which there are numerous and striking exceptions.

From the nature of the question it is evident that any determination as to the means whereby human life may, in serviceable shape, be prolonged beyond its present average limit will be very difficult to effect. The only possible basis of the inquiry will be in experiments and observations, extended over a wide field applied to the higher *Mammalia* of species such as our domesticated animals, as well as to man. In the case of man, experiments will be difficult if not impossible to accomplish, unless perchance they were essayed either on life prisoners or on persons who might be willing to sacrifice much of their liberty for the good of their kind. None of these classes of opportunity are likely to have much value, at least in the present state of public opinion as to the value and sacredness of life. In the lower animals the difficulty of the inquiry, so far as the physical side of the problem is concerned, is not great. The trouble is that the index as to the survival of the mental powers which could there be obtained would not be satisfactory. We should thus miss the main point of the inquiry, for the task is not merely to keep people alive up to the organic limit of fivescore years, but to maintain them in their normal mental powers. To establish a body of folk in their second childhood would be merely to burden society with a larger number of defectives than it has at present to care for.

Observations on the differences in the endurance of the vital powers, bodily and mental alike, applied to those engaged in diverse occupations and dwelling in varied conditions of climate, would doubtless throw much light on the question of longevity. So, too, would a study of the physical conditions of those families in which the endurance of the body and mind was more than usually good. From such studies in man and brute we may hope, in time, to attain to the first stage of a system by which the individual might have a better chance to secure the term of life which the conditions of his body evidently tender him.

The question as to the means by which a sound old age may be more frequently attained should not be left, as it now is, to accidental and unorganized inquiries. From the nature of the researches demanded by the problem, they are beyond the scope of individual study. They need to be undertaken by some institution where there will be an orderly and uninterrupted process of inquiry. Such conditions may possibly be found in a government establishment, managed as are the bureaus of health of some States, or, better still, by a society under the control of some institutions of learning, academy or university. With sufficient means to pay for a fit staff, such an organization would even in a generation be able to do much in advancing these researches. It would afford a centre about which studies of the problem would gather, so that, in time, perhaps within a few decades, we should be able to discern, in part at least, what needs be done to attain the desired end.

It may be well to note that, while the problem of the development of old age to its fit state as a normal and useful period of life is clearly related to the whole problem of sanitation in the large sense of that word; it is not quite identical with it, for the reason that the question of normal longevity concerns other matters than the mere time of death. It concerns the survival in a useful form of the powers of mind and body which last beyond the normal reproductive period and not the mere physical life of the individual, which is indeed a matter of small importance. Therefore, it is desirable to separate the inquiry concerning the conditions of a vigorous old age from those which relate to the questions of public health in the ordinary understanding of that matter. The fact that this difference exists is well shown by the absence of any considerable attention to the problems of longevity on the part of the existing bureaus of health. This apparently indicates that the proposed task should not be added to the burdens of our already encumbered sanitary boards, but should be assigned to some other organization.

Those who are in the habit of carefully observing people may have noticed in women who have passed the climacteric, or between the forty-fifth and fiftieth year, a considerable enlargement of intellectual interests. So general does this appear to be that it may be regarded as normal, and as indicating a natural tendency of the mind to claim its rights in the peculiar human period of old age. Among men, perhaps because there is no such distinct change in the work of the body or the load of care, this enfranchisement of the spirit is less often and less clearly seen; yet there too, I am satisfied from the instances I have observed, it tends also to occur, and needs but a little fostering to become normal.

The question may well be asked, Why is it, if this possibility of a distinct growth in the period commonly regarded as one of decrepitude, it has not been long and well known? I am disposed to warrant even the ire of the reader who finds in my suggestion something that flies in the face of all human experience, for what is more certain in this world than the decline of man in old age? But, before he dismisses the suggestion as preposterous, it will be well for him to consider the fact that there is a curious weight of tradition supporting the view as to the incompetence of old age, and that much of this rests upon the habit of judging men by their value in war. This tradition rests, moreover, upon a body of experience formed in ages when the conditions of life were such as to bring about enfeeblement at a relatively early time. Among the greater gains of civilization, we may count among the foremost the improvements which enable sound folk of station to attain the best term of life almost unbroken in body and the change in the basis on which men are valued. Therefore, we are here in a measure dealing with a new problem, one that can not be solved by a reference to the past. It seems clear that the matter is worthy of a careful explanation. It is evident that we have in the old age period of man a gift of years which we should seek in all ways to enrich. To effect this we need to ascertain the possibilities of activity which it opens to those who may attain to age.

The demands made on the body and mind during the reproductive period of life are great. This is also the time when the burden of care for the young and for subsistence is most engrossing. It commonly happens that at some stage of the middle period, if at all, the man or woman is much freer than before to live the intellectual life. If the earlier years have been altogether given to commonplace affairs there is no chance that enlargement may come with the opportunity for it which the falling away of other interests affords. If, however, the capacity for any intellectual work has been kept alive, it may then find its chance of activity. I have observed a number of instances of such development in people of some natural ability after the middle of the term, say, between the fiftieth and the sixtieth year. In some of these latent capacities of a nature unsuspected even by the persons themselves, have appeared and attained a quality which was in its way admirable. It is not at all probable that great attainment will be won in an art or science where it is taken up in middle life. All its years are commonly too short for such winning, but what is really the most important gain, that of self-culture, can thus be had. There is, moreover, a strong and wholesome sense of triumph to be had from this late breaking into new fields, such as youth with its manifold interests and scant knowledge of life can not know. To the oldish person who is a bit weary with the repetitions of his days, to whom the best of his profits have already a tiresome sameness, the effect of a new accomplishment is magical. It is like the discovery of an oasis in the desert. It brings again the joy of youth, for the most of the pleasure of that time lies in just such excursions into the great unknown of the self.

Some anatomists tell us that the brain begins to shrink at fifty, and certain of them venture to assert that no original work can be done after that time. The facts are, however, so against that assertion as to deprive it of any value. Whatever may be the truth as to the brain itself, a little knowledge of its product in the way of masterpieces will show that with persons of natural ability and sound body the doing power may well last for a score or more years past the half century.

CHAPTER XV

IMMORTALITY

THERE are evident reasons why natural science should not have much of value to say concerning the conditions or the possibility of individual spiritual life apart from the existence of the body. The little that is said in this chapter finds its justification mainly in the fact that some—indeed, we may say many—physicists have, with unjustified assumption of authority, stated too much on this question; so that the naturalist is entitled to make his disclaimer and to set forth what seems to him the reasonable interpretation of the truths relating to it which come within the fields of his observation.

Before undertaking to set forth what may be observed in the material world in relation to immortality or fairly inferred from such observations, it will be profitable to consider the position of the investigator of phenomena, his limitations and the nature of his successes. This by way of making it plain as to how far he can expect to see into the depths of the world he seeks to explore. There is a common notion, one unhappily shared by many able students of Nature, and by the most of those who regard themselves as naturalists, that by entering this procession they become in some manner curiously enlightened as to the mysteries of the universe—in a way made free to form safe judgments concerning all that goes on in that realm. There is much of the ancient notions concerning the powers of priesthood in this claim to far-reaching knowledge, a claim which is too freely accepted as valid.

An examination of the matter shows us that those who are professionally engaged in what is termed scientific inquiry are doing a work which differs in no essential way from that which men have been engaged in since they entered on the human estate. Standing in face of the vast complex of Nature, men have ever been forced to ask the questions of why and how. Out of the multiplicity of occurrences they have selected certain of them and have endeavoured to find how they were related to other happenings. At once they saw, as the savage indeed sees, that very often an event occurs because something was done before it came about and certain other events follow in the same train. This sense of the enchainment of actions has been the foundation of our conduct in all our history as men. The naturalist, using this term to designate all those who are intimately concerned with scientific inquiry, differs from his fellows of the more ancient employments in no other regard save that he has learned, or at least should have learned, certain rules, based on experience, which serve somewhat to diminish the risks of error in judgment and something of technical skill in the application of his resources. Thus he should know how to verify his data and to criticise his conclusions somewhat better than the mechanic or the merchant ordinarily learns to do. As a matter of fact, however, there is not much difference in the measure of the verifying and criticising skill among the abler men of any of the walks of life. Except for the craft knowledge, the better men in the economic field are as truly men of science as their brethren to whom that term is commonly limited.

There is a difference between scientific and business inquiries, in that the former confess no limits, while the latter are bounded by the conditions which make for gain. The result is that the naturalist has been able, by using one discovery as a stepping place for the next, to push his knowledge as to the sequences of actions on many different lines for a considerable distance beyond the bounds of the self-evident. It is this penetration into the fields unknown by ordinary men which has given the glamour captivating to the imagination, and leads people to believe that those who see so far on dark ways must be able to penetrate the mysteries of life and death and make the universe plain. It is hardly to be wondered that these successes have deceived many of our path-breakers as to their accomplishments, causing them to feel that the gates of all knowledge are opening to them. The results of the last hundred years of active inquiry have been again and again to double the mass of the information which has been gathered in the centuries since men began to question Nature. But all those who see beyond the surface are forced to recognise the truth that the proportion of what is known to that which is knowable but undiscovered is in no wise diminished for all the researches that have been made. Each thread of action we follow up reveals an endless number of other threads inwoven with it in the fabric of causation. Thus the undulatory theory of light, which at first glance seemed relatively simple, has on further investigation led to the conviction that there is not one such motion in the ultimate particles of the ether, but an indeterminable number of them coexisting in that substance, each transmitting a peculiar quality of energy, differing one from another as the waves of ordinary light from those we term the Röntgen rays. It now seems likely that we have but begun to understand the variety of effects which are thus propagated by the motions of the ethereal medium: they may be indeed essentially infinite in number.

In whatever direction the naturalist penetrates in the interminable forest of phenomena, he finds the same tangle of causations. He selects, so to speak, particular trees which he follows from their roots in the unseen deeps of Nature, through their evident branchings; but as there are no limits to these groups of action, he ends always with the sense that the known, however far his knowing may go, must ever be to that which is to remain undiscovered as one to infinity—as nothing to the whole. He recognises, or should do so, that all he may know lies as it were in one plane—that of his own limited nature, that determined by his own features, by his mind and the apparatus of his senses. The realms of the infinitely great and the infinitely small are beyond his approach. He easily recognises that there may, indeed must, be other types of being beyond the infinitesimally small field which is to his eye the universe. Less easily, yet still clearly enough, he divines that the depths into which we ineffectively peer with the microscope are as fathomless as those of the heavens, and that the order of the molecule and the structure of the atom are likely to be in dignity and complication of relations as well as in their interminable depth of a splendour like to that of the stars. Such considerations, and others of like quality, come to the discerning student when he reflects on the state of man's knowledge, existing or to be. How, then, is it that naturalists are led to the false sense of certainty as to the value of their explorations in determining such questions as the immortality of the soul? The reasons for this state of mind, apart from those of pure conceit, appear to be as follows:

The most admirable result of natural inquiry has been the conception that all the occurrences of the visible universe are related in the manner of antecedent and consequent, or, as we say, as cause and effect; that nothing lies without the enchainment of actions. Along with this has come the conviction, eminently well founded, that the energy involved in action is never lost, but only changes its form of activity; so that when a given amount of water rises into the air by virtue of the heat which the sun has applied to it, it returns the same amount of energy to the air or earth in its condensation, in the friction it receives in falling or in striking upon the surface. This doctrine of the conservation of energy, as well as the clear conception as to the linked quality of all actions, has taken a firm hold of the minds of all inquirers. They have together shaped the modern state of opinion as to the control of the universe. There can be no question as to the truth of these opinions, but from any well-demonstrated proposition it is possible to draw erroneous corollaries. In my opinion one such has been drawn, not altogether unfairly, but inadvertently, from the nature of causation and the conservation of energy, which is likely to lead the unwary into error. This is to the effect that because we find the unending series of antecedents and consequents, and of energy changing but in its mode of action, all the operations of Nature involved in these series keep from step to step the same quality. This idea of the uniformity of action is rarely stated, but it is tacitly assumed. It leads to the opinion that sudden revolutions and changes in the modes of action do not occur, that the consequent must be like the antecedent—a proposition that has but to be examined in the light of the simplest facts to be disproved. For in any considerable natural series, even where the factors are apparently of the simplest, we are likely to find sudden diversions in the trend of events which utterly change the path of the actions, leading them, at some critical point, into an entirely new realm.

The best, because the simplest, example of the revolutions, often catastrophic in their nature, which we may observe in endless variety in Nature, is afforded by the behaviour of water under varying degrees of heat. There appears to be no process of a less complicated kind than that which we institute when we change the temperature of this fluid. Beginning at a high temperature, these elements are necessarily dissociated. Lowering that temperature to a certain point the gases which when united form water will, under definite conditions, as by the action of an electric spark, fly together; at the moment of their union producing a substance not resembling either of the parent elements, or rather, we should say, entirely different from either of them. So far as we can give any meaning to the word there is then and there created a set of qualities such as the universe did not know until the first molecule of water was formed. On these qualities, indeed, depend all the possibilities of organic life. It is not too much to say that in passing the critical point of temperature these two gases in an instant originated all the possibilities of what we know as life from its beginnings to the action of the mind and hand which shapes this very phrase.

Yet into this action there go only very simple antecedents which we can hardly imagine to contain in themselves all the consequences which they entail. There has to be supposed some kind of origination in the effect; not an origination of energy, but of direction or quality, be it what it may.

Following the history of water in relation to lessened heat, we find that from the temperature at which its constituent atoms may be associated in the molecule of water to the boiling point, the material is in a state of vapour, in no essential manner resembling the elements of which it is composed. As the temperature is lowered toward the boiling point, the vapour undergoes only a proportionate change in the distance of its units one from another; but at the critical point, with a suddenness which is like that with which it came into existence as water, it then undergoes a revolution, becoming a fluid. The difference in the actual temperature of water in these two states of vapour and of fluid is immeasurably small. It may indeed be assumed as infinitely slight, yet the effect of this difference is vast; it is most evident to the senses, though the hidden changes are probably far more numerous than those which are revealed.

Following yet further the action of water under decreasing temperatures there are slight critical points which may be noted, but the most interesting of all we find when the freezing stage is attained. There is here again a crisis: without a measurable difference of heat, all the important qualities of the material are at once altered. From being the agent of wide-ranging activities and the basis of organic activity, it becomes an almost inert substance, effectively influenced by gravitation alone. We have here another most momentous of the critical points with which our own affairs are directly concerned, for, as before noted, all the possibilities of life are linked with the action of water in its fluid state.

What has been said of water shows that at three points in a narrow range of temperatures, say from 0° to 720° C.—a very trifling part of the scale of heat which exists in the solar system—we find three sudden revolutions in the conditions, each introducing an unforeseeable group of qualities and an entirely new group of relations to other things. But for observation these crises would be entirely unpredictable as to their point of occurrence or the nature of their results. At each of them we have in effect a place at which absolute origination of quality is in some way brought about. It is evident that the results measured in terms of energy do not differ, but with infinitesimal changes in this energy we have practically infinite alterations in the modes of its operation.

Although from its relations to organic life the critical points of water are of more far-going importance than those of any other materials, they are paralleled in the case of all the elements and most of their compounds. With variations in the energy applied to them they exhibit like crises in passing which the qualities and relations are revolutionized. Though we have considered only the effects of heat in relation to critical points, it is only one of the agents by which such crises are produced. The same element of the unexpected, we had better say of creative action, is found in the chemical processes where the skilful manipulator may by artifice combine elements, or their combinations, so as to produce results never before attained in this world, if indeed they have ever come into existence until they thus come into being at the hands of the chemist. Again we find the same absolute changes exhibited in the laws of motion. Between an orbit of the extremest possible eccentricity and a hyperbola there is but an infinitely slight difference, yet moving on the one a body returns on its circling way, while on the other it departs from it. This feature of crises not only penetrates all the fields of the actual in Nature, giving at every point distinct or indistinct creative centres, but it is to be found even in the mathematics, that shadowy spirit of the phenomenal, for in certain of its series, which resemble those of Nature, we have like breaks in the order of succession.

It may well be asked, how it is that if there be, in truth, this element of continued innovation in Nature, the existing conception of serial uniformity, of absolute unbroken succession, and of perfect predictability has ever come to exist. The answer is not easy nor can I hope to make it complete. In part, at least, it is due to two considerations which may now be briefly stated.

The concept of causation by the application of energy passing onward from event to event appears to be so implicit that it leads the mind to assume a knowledge as to the nature of the action involved which it does not really possess. Thus we almost instinctively assume that, because we perceive the continuity of the events, we take account of what really occurs in these actions. The very words we use in noting the phenomena become what Bentham so well termed "question-begging epithets." Thus it is that upon the well-laid foundations of actual knowledge concerning infinitesimal portions of the material world there has grown up a structure of fancied completeness of knowledge which, on examination, we perceive to have no substantiality. Yet, to the general public, and even to many successful inquirers, it appears as a solid edifice. Those who criticise their thought know, that for all our discoveries, vast though they be, the real nature of actions remains unknown; that each event in the streams of energy has in it something that is not explained; and, further, that there is involved in each turn of action which occurs at the infinitely numerous critical points in the processes of organic and inorganic change an origination we know not how brought about, which may, and often does, effect startling revolutions in the character of the phenomena.

There is another influence which has made for the existing limited and incorrect conception as to the scope of our knowledge of the universe. This may be defined as the idol of the commonplace or the instinctive state of mind which leads us to assume that what we see is all that is to be known. The strength of this prepossession is easily and naturally overlooked, for even more than other prejudices it is self-protective, for it guards the mind against impressions which might serve to perturb it. We may gain some slight impression of its efficacy in blunting the mind to the mystery of things by a simple experiment. As I look across my room my sight ranges through the air. This air is instinctively postulated as simple in its nature for the reason that I see through it and behold nothing therein. · My knowledge tells me that it is in fact a plexus of actions and qualities so vast and complicated that if I saw it with complete understanding I should surely know more than all that has yet been learned of matter. For the moment this critical view makes a strong impression on my mind, one so great that it seems likely to endure; but, when after a moment of this thinking I look again, there is the same apparent emptiness, and with it the old suggestion of simplicity. So it is whenever we look and with whatever appliance we may aid the vision. The mind can not build with other materials than it has in its store. It must postulate emptiness as the common bond between its fragments of knowledge. It must suppose the commonplace, the self-evident, the completely explained, all about it, in order to have any comfort in life—a life without this protecting envelope, a world where the mysteries were allowed to crowd against us would be mentally uninhabitable to creatures of an estate like our own. It is well enough to enjoy this familiar, domesticated relation with our confined nature, but it should not be allowed to hide the deeper from us in the manner it now does.

We see the effects of the commonplace view of things in a more adequate way if we note the natural history of this state of mind. We readily conceive that to the animals below man any insight into the realm was impossible. Nearly all their impressions are of the simplest order. In the lower races of men, and even in our own, down to very recent times, hardly a man found his way beyond the commonplace except through the momentary excitations of the imaginative impulse. Even this impulse rarely led to any sense of the complex of Nature. In its scientific aspect this conception of the infinite order about us is not only very modern but has been attained by few, and held only in rare moments, when the constructive imagination dealing with the data of science enables us to see dimly, yet effectively, how false is the impression which the commonplace view gives us of the truths of Nature, and how a truer understanding, such as we now obtain only in glimpses, is to be the heritage of our successors of the larger time.

It may seem to the reader that overmuch has been said in order to bring to light the limits of our understanding of the natural realm; but if he has had some experience with the prejudices which have grown up concerning the function of the investigator he will recognise the importance of such a discussion. Only by a study of these conditions can we make ready to examine the dicta supposed to be scientific concerning the problem of human immortality which have been pronounced by able naturalists. What has been said above concerning the fundamental error of the greater part of the reasoning which has been applied to the explanation of natural processes will account for some of the arguments against such survival. Beginning with the simplest, we find the ancient idea that the separable spirit if present in the body must have a definite abiding place, some organ or its equivalent by which it acts. It is easy to see that this notion could have been held by those only who were persuaded that all a man is is revealed to the skilled anatomist. This view represents a fairly logical outcome of the old idea that the whole of a natural process is no more than what appears to us. As this argument, if such it may be called, is no longer adduced, it needs no mention save as an index of the primitive state of man's understanding as to the modes of natural processes.

The argument which has taken the place of that just above mentioned—which is indeed its much improved successor, and now in its best estate—may be briefly described as follows: The functions of the body are but modes of expression of the energy which it obtains through the appropriation of food. As regards their origin, these functions may be compared to the force which drives the steam engine, being essentially no more mysterious than other mechanical processes. Now, the mind is but one of the functions of the body, a very specialized work of the parts known as the nervous system. We can trace the development of this mind in a tolerably continuous series from the lowest stages of the nervous processes, such as we find in the *Monera* or kindred *Protozoa* to man. Thus it is argued that, though the mental work of our kind is indefinitely more advanced than that of the primitive animals, there is no good reason to believe that it is other than a function of the body; that it is more than a particular manifestation of the same forces which guide digestion, contract muscles, or repair a wound. Furthermore, as is well known, at death all the functions of the organic body fall away together in the same manner and at essentially the same time, so there is in fine no more reason to believe that the functions of the brain persist than that a like persistence occurs in the digestive function or in the blood-impelling power of the heart. All this, and much more, can be said to show that the phenomenon of death appears to possess us altogether when we come to die.

To those who hold to the illogical idea that we can observe all that happens in even the simplest natural fact, the process of death may, in the form above stated, appear as a sufficient basis for denying the possibility of immortality. But the naturalist who has learned to limit his confidence in his discovering powers will not be ready to say that these facts do more than raise a certain presumption against the continuance of the mind after death. If he has made a study of those modes of change occurring at what I have termed critical points, he will be likely to suspect that much may take place in the revolution that evidently occurs in dissolution which he does not see at all. There is, it is true, nothing in the visible facts which in any way leads to the supposition that the mind lives on after the breaking up of the body by which it is manifested. But no well-trained observer who has carefully remembered his experiences with phenomena is likely to affirm that he finds in those of death anything that can fitly be termed proof that the mind does not survive.

If the discreet naturalist were asked how he could conceive the survival of the intelligence to be effected after the machinery by which it had apparently been engendered had disappeared, his answer might be somewhat as follows: He would first call attention to the fact that in the process of reproduction all the experience of the antecedent life is passed on from generation to generation, over what we may term a molecular bridge. Thus, in the case of man, a tiny mass of protoplasm, imponderably small, carries on from parents to child the body, the mind, all indeed that the predecessors in tens of thousands of specific forms and unimaginable millions of individuals have won of enduring profit from their experience. Therefore, even within the narrow limits of the known there is evidence that the seed from which an individual intelligence may be evolved can be effectively guarded and nurtured in the keeping of an exceedingly small body of matter. In a word, the facts of generation show us that under certain conditions life as complicated potentially as that which passes away from the body at death may reside and be cradled in states of matter which are, as compared with the mature body, very simple. It is difficult to resist the conviction that it is in the process of generation, in the keeping of the atoms, molecules, or whatever else be the ultimate form of the transmitting agents. Be it understood that this is not an argument to show that the spirit of man goes forth in some part of the dust of his body. The point is that the known properties of matter are so complex and our ignorance as to the range of these properties so great that the facts of death can not be made a safe basis for a conclusion as to the survival of the intelligence.

To the argument that all we know of intelligence is limited to what we find incarnate in animals of various degrees, and that all the supposed evidence going to show either the survival of definite individualities after death or the existence of intellectual powers in Nature has fallen before the assaults of science, the careful naturalist has still to object that the proof of these propositions is lacking. A number of men of no mean authority as naturalists, some of them well trained in experimental science, have, after long and apparently careful inquiry, become convinced that there is evidence of the survival of some minds after death. It is a sound rule to trust the observations of men who are known to be honest and able to the point of maintaining at least a waiting mind until they are shown to be mistaken. It is indeed in no other manner that we can go forward on the ways of inquiry. Therefore, until some demonstration is attained in this matter, the work of those faithful observers who are engaged in the painful and unprofitable business of seeking the truth in the abysses of superstition and fraud in which they have to labour, the fair-minded observer must withhold his judgment as to the existence of positive experimental evidence concerning the survival of the mind after death.

As for the assumption that there is no evidence of intelligence in this world other than that exhibited by man and his lower kindred, the critical observer has again grave doubts to suggest. Without attaching much importance to the Paleyan argument or to any other like modes of teleological reasoning to prove from design the existence of contriving intelligence at work in Nature, he may give his dogmatic brethren pause by forcing them to consider the evident relation between the natural order and the æsthetic motives of our own minds. The fact that Nature is beautiful to us, that its actions meet a swift response in our minds, is best explained, indeed is hardly explicable otherwise, by supposing that its informing spirit is akin to our own. This argument might go further and hold that because of our intellect we are forced to suppose a like quality in the power that shaped us; but that would be to go beyond the narrow limit of the affirmations which the naturalist as such has a right to make.

So far I have endeavoured to represent the critical attitude which the student of Nature is entitled, we had better say bound, to take toward those persons who, seeing a little of phenomena, venture, after the manner of the worst priests, to claim knowledge which they can not have. There is, however, another point of view, one from which the naturalist, without altogether departing from his straightened path, can give some little help to those who are seeking an answer to the question of immortality. What he has to show, after the manner of all else that is brought into this field of debate, is shadowy and inconclusive; still, it may be of account.

It may, at the outset, be assumed that the inspection of the infinitesimally small part of the universe which is known to us raises no presumption of value for or against the doctrine of immortality. It might be said that there is some burden of proof on the affirmative; but when we consider that the realm in which we live is to be postulated as a universe in which anything may happen, we are justified in regarding the field of possibilities as quite open. It may also be held that in criticising the system of this natural realm we as men have to judge of it from the point of view of our own understanding; when we consider that our minds have come forth from the cosmos, that what they have has been derived from immemorial training in brutes and men, we see the more reason for trusting the impressions which our minds have thus received. Furthermore, all successful scientific inquiry shows us that the only way to interrogate the deeps is by sending into them well-framed conjectures, hypotheses which state what the order of events should be in order to satisfy our minds. That this method of exploration is good is shown by its exceeding success: by it we have drawn from the darkness all we have of light. It is indeed safe to say that any general truth in science has been known to the discoverer before it appeared in the facts, as critically verified. Verification was sought for the reason that it was demanded in order to reconcile the thought with the observations. It is not necessary to say that many of these essays at interpretation fail. They are most often found to be more or less ill fitted to the actual. Yet it is a remarkable fact that in the history of the important hypotheses which have been applied to the realm, by far the greater number have had some share of truth in them. Even in the field of astronomy when the errors have been the greatest, the successive erroneous guesses have in many cases helped toward an understanding by assembling and correlating the facts so far as known. Thus, though men at first stagger and stumble in the path of inquiry, they still move on toward the truth. It is their duty to go forward, however dark the way, for they may be sure from experience that it leads toward the light.

Therefore, we may with confidence proceed to question the realm with our constructive imaginations as to the probability that intelligence may survive the crisis of death.

The first point to be noted is that the order of advancement in the physical realm leads, as before noted, to the institution of more and more complicated organization of the primitive units. The obvious tendency is for the atoms to gather into molecules, and these in turn to climb into more complicated associations. For some way up in the series these societies of matter, the molecules, the crystals, the concretion of the celestial sphere, appear to win no more than their own forms. At a critical point, somewhere about the protoplasmic grade of organization, they enter upon an altogether new field, one that is entered by none of the inorganic forms. In this field the aggregates become sensitive; they are educable; they gain experience and transmit the profit thereof to the successors of their bodies. Thence onward in the scale of being to ourselves an altogether new question is presented to these organic individualities. This is the question as to the ways in which the experience, the harvest of successive individualities, may be preserved and transmitted. How well this task has been accomplished on this sphere is shown by our presence here in a shape to discuss the matter we have in mind. Without a measure of direction, which in common phrase seems miraculous, the successions of being necessary to elaborate intelligence to the human station could not have been attained. We have to believe that something analogous to if not more nearly allied with the sense of purpose in our own minds, has guided in this work. The reasons for making this preliminary hypothesis are, in brief, as follows:

It is a fact that in the organic life of this world but one series, that which leads to man, has attained to a high measure of true intellect. The other series have developed that form of mental action we term instinct. The birds have brought the emotions to high degrees of perfection, but the only commanding mind is that of man. It is also evident that the possibility of man's development has rested on the successive institution of species in linked order reaching down at least to the level of the lower vertebrate life and back to a time probably at least as remote as the Devonian period. If, in this succession of tens of thousands of species, living through a series of millions of years, any of these links of the human chain had been broken; if any one of the species had failed to give birth to its successor, the chance of the development of man would have been lost. To the suggestion that there might have been a replacing branch from the same tree of life, there is the answer that there are not, and so far as the record shows there never have been, any other candidates for the peculiar station of our kind save our immediate kindred. So far as we can see, the possibilities of our kind have been limited to one enchained succession of species. So, when we consider what the struggle for existence means and has meant through all the ages, we are forced by this evidence to believe that there has most likely been a control of an intellectual nature over the events. It may be that the result is merely fortuitous; but, if so, it must have been almost as one to infinity against the chance that the summit should have been attained in man.

If we fancy a being of an appropriate intelligence beholding the outset of the organic series on its long journey through the ages, foreseeing the intellectual goal, and on the way to it the innumerable chances of accident which would leave it short of the supreme success, we may well imagine that this success would have appeared to be practically unattainable without the guidance of a controlling power intent on the end. It is true that any one of the steps toward man, say the first, may conceivably have been won by chance, and that the probability of the second fit advance occurring would not be lessened by the first success, and so on to the end of the series; but the chance that the happy casts should have been continued without a fatally destructive break would have appeared to our supposed observer as essentially impossible.

To put this matter into simpler form, let us compare the construction of the series which led up to man to the process of throwing dice. The chance of throwing the bits so that double sixes appear, is relatively small, as trial will readily show. Yet it is certainty itself compared to the chance that any group would by hazard develop toward man. Now, if on a second throwing of the dice double sixes again appeared, any critical mind would begin to suspect that they were loaded; and if, on hundreds of casts, a like result invariably appeared, he would have the most absolute proof that can possibly be had to show that chance did not determine the occurrences, or, in other words, he would be compelled to support the existence of some kind of control leading to the particular result. This is, in effect, what we find in the development of the series of animals which leads to man. If we are to judge that work by our intelligence we are led to the conclusion that the succession was determined in substantially the same way that we determine the results of our own contrivances. It is, of course, open to those who have a mind to adopt the position to choose the other horn of the dilemma, claiming that the result is after all due to mere law, or, what comes to the same thing, that it arises from the mechanics of a universe without intellectual control. But such a conclusion is illogical, for the reason that it does not account for the existence of something that dominated chance. It is not likely to be adopted by any one who has the spirit of inquiry in him.

The facts connected with the organic approach to man afford what is perhaps the strongest argument, or at least the most condensed, in favour of the opinion that there is an intelligent principle in control of the universe. To those who have devoted themselves to natural inquiry, at the same time keeping their minds open to the larger impressions which that field affords, there generally comes a conviction as to the essential rationality of the operations. They have to consider facts which can not be otherwise explained, except on the supposition that a mighty kinsman of man is at work behind it all. Again and again the naturalist feels that this or that feature of the order exactly satisfies him, just as he feels that the turn of a phrase or the shape of a thought in an author is after his own mind. In fact, to the inquirer this recognition of himself, of his own intellectual quality in the events he is considering, gives the sense of the highest pleasure which his occupation affords. By no means all those who successfully make researches perceive this quality of their work, yet I believe that it is present with them all. Nor is it limited to the naturalist. Much the same state of mind is afforded by the contemplative state of mind with which one views the beauty of the landscape, of a flower, in fact any of the many expressions of the realm. The joy we have in those exercises of the intelligence arises in large measure from the fact that we feel the kinsman in the thing we behold.

It is possible, indeed, that all our recognition of a spirit akin to our own in the forces which give rise to the harmonies of Nature may be purely accidental. It may be a mere delusion, something we have sent out of ourselves, and not a thing which comes from without to us. Here again we have to treat the matter on the test of probability. If this accord happened rarely, if Nature were only occasionally in touch with our minds, we might take it as the result of chance, but the phenomenon is so persistent, so much part of man's very nature, that we can not thus pass it by. We have to suppose that there is an accord between the spirit of man and the ultimate of the universe somewhat like the correspondence which we find between the mathematics and the phenomenal order—the one being to the other somewhat as shadow and substance.

There are very many illustrations going to show in a cumulative way the likeness between the fundamental of natural processes and the mind of man. Of these I can in the present writing note but one group of facts which relates to the unprofitable completion of organic series involving the development of some structure far beyond the limits of utility—indeed, to a point where it becomes positively injurious, so as to lead to the destruction of the species which are affected by it. The clearest examples of this kind are to be found in the lower invertebrates where the baffling hypotheses of sexual selection can not be applied, because either the sexes are united in one body or there are no organs of vision. At the risk of appearing to seek the recondite, I shall cite the case of the *Terebratula dyphia*, a group of the *Brachiopoda*, or so-called "lamp shells," where, as in nearly all the genera of the class, there is a sinus, or broad groove extending from the back to the margin of one valve, with a corresponding ridge in the other valve. So far as we can determine this feature has no functional value. Being thus free from the bonds of use, it is, as is common among animals, curiously played with. These mesial divisions attain their maximum in a certain Mesozoic species of the above-named group, where the sinus is deepened and extended toward the hinge until the cavity of the shell is practically cut in two parts, the only connection being by a narrow tubelike opening near the beaks. That all this is as unprofitable from an economic standpoint as are most of man's fashions will probably be clear even to the extreme selectionist. The fact that the group passed away, as such groups usually do, as soon as it had completely worked out the theme, sufficiently indicates that it was successful only in its perfect accomplishment of an idea. This is but one of hundreds of instances of like nature which a mere glance at the field of ancient life has served to show me.

To those persons who are committed to a solemn view of Nature, the suggestion of there being anything of the fashion motive in the realm will appear preposterous if not impious; but to my understanding there is just as much evidence of this frolicsome spirit in the shapes of things as there is of rational qualities. It would not be difficult to make, from my own very limited knowledge of organic forms, a list of one hundred instances in which features like that described have been made the basis of extravagant, economically profitless yet persistent variations which can only be logically accounted for on the supposition that they are the result of an action which leads to the same result as we find in the work of the human fancy. Among existing organic forms, below the plane where sexual selection is possible, a fair inquiry would doubtless show many thousand such instances. It would be an interesting task to bring together these evidences of a quality in Nature which has been neglected by students, but the matter must here be passed by with this bare mention.

The foregoing reasons, which are much less extended than the matter deserves, show at least the general method by which the naturalist may be led to the conclusion that the universe is under the control of power in ways like unto the mind of man. The judgment does not lead to the assumption that the likeness is complete. At most it gives little save hints as to the measure of the kinship. But, imperfect as is the hypothesis, it is the only solution of the facts which in any measure satisfies them. It is more rational than any supposition which excludes intelligence from a pervading and controlling position in the universe. Such, then, are our points concerning the matter of fact as to the immortality of the soul. We have the evidence from the transmission of the potential qualities of man over the frail molecular bridge of the egg that the spirit may safely be given into the keeping of other forms of matter than the brain affords. This raises the presumption that matter in certain forms far simpler than the nervous system can contain the germs of an individualized intelligence. Next we have the series of facts going to show that the presumption is altogether in favour of an intelligence of some kind, presumably akin to our own, which abides in or dominates over phenomena.

It is evident that a perfect demonstration of the intellectual control of Nature, or of the capacity of what we term matter to be converted into what we term mind, or *vice versa*, would not serve to prove the endurance of our individuality after the crisis of death. In that condition of the universe we might have a common store, a sea of consciousness from which our individuality proceeds and to which it returns even as the dewdrop slips from the leaf into the stream and seeks the ocean. The only direct evidence that can claim scientific inquiry, which goes to show the persistence of the individual after the body dies, is that afforded by the so-called occult phenomena; by the alleged appearance of spirits, or the communication with what appear to some inquirers to be the minds of the departed. To some enthusiastic persons it seems as if it would be an easy task for the naturalist to turn his search into this field; that it is his duty by his profession at once to set about the task; in fact, Mr. A. R. Wallace, in his account of the Nineteenth Century, sets it down as one of the delinquencies of our age that it has failed to devote a fit share of attention to these mysteries. The reasons for this apparent neglect of what at first sight may seem a great opportunity are at hand. They may thus be set forth: The mass of appearances now termed occult has been known to man ever since he began to watch the depths about him. It entered into all his early interpretations of Nature. Acting on his untrained imagination it created a monstrous burden of superstitions which for ages weighed his intellect down. Science with great difficulty crept from beneath this oppression to find a clean and wholesome field where slowly and carefully it has won its gains from a reluctant but honest world as a reward for patient labour. To ask it to go back to the study of the "black art" is to bid it again into the stronghold of its ancient enemy: from a field of work where it can trust its foundations to one where it can not see a safe place whereon to plant its feet. In this there is justification enough for all the reluctance which most investigators feel to re-entering the dark realm.

There are other reasons which have kept the abler naturalists, with very rare exceptions, from the study of occult phenomena. The experience of those who have entered into those blind places has shown that it is now as of old almost if not quite impossible to obtain there data which have the quality needed in physical inquiry. For such researches we need facts altogether purified of hearsay or self-deluding influences; such appear to be practically unattainable in that dark country. Those students of Nature who have essayed the methods of their art in that realm have generally found themselves in the position well satirized by the Greeks when "one is milking a he-goat and the other holding a sieve." Therefore, while we may wish our courageous and self-devoted brethren who are essaying the use of scientific methods of inquiry in winnowing the scant grain from the mass of chaff all possible success, we can not be hopeful of the harvest that is to reward their apparently hopeless undertaking.

The soundest reason for the neglect by naturalists of the realm of spiritism is to be found in the relative value they assign to the fields of possible knowledge. In olden times the only questions of real importance were felt to be those which immediately and effectively concerned men. The development of natural science has bred in its votaries a higher state of thinking, one in which the great realm is seen to be more important than any of its parts, even our own personality; so that, in a way, inconceivable to the ancients, many an inquirer would be better pleased to know the real nature of gravitation than to be assured that the duties of life would still be demanded of him after the crisis of death.

Notwithstanding their urgent disinclination to meddle with or be muddled by the problems of spiritism, the men of science have a natural interest in the inquiries of the few true observers who are dredging in that turbid sea. Trusting to the evident scientific faithfulness of these hardy explorers, it appears evident that they have brought up from that deep certain facts which, though still shadowed by doubt, indicate the persistence of the individual consciousness after death. It has, moreover, to be confessed that these few and as yet imperfect observations are fortified by the fact that through all the ages of his contact with Nature man has firmly held to the notion that the world was peopled with disembodied individualities which could appeal to his own intelligence. Such a conviction is itself worth something, though it be little; supported by any critical evidence it becomes of much value. Thus we may fairly conjecture that we may be on the verge of something like a demonstration that the individual consciousness does survive the death of the body by which it was nurtured.

It is a very extraordinary, though not, as Mr. Wallace thinks, a blameworthy condition of the public mind that now when we appear to have something which looks to certain careful inquirers like proof of immortality, men in general give but little attention to the matter. But a century ago, even in the last generation, when spiritism had its great revival, such presumptions in favour of that view as the society for psychic research has established would have fired the minds of men. This neglect of a subject in which we might expect people to be greatly interested may fairly be ascribed to the remarkable change which has been made within the last half century in the attitude of men toward Nature and consequently toward the problems of life. Of old, within the memories of those who can look back for four decades, the popular conception of the material realm was that of a more or less repulsive chaos which of necessity concerned man, but with which only an erratic naturalist had really to do. It was, as it had been from the beginning, an unfriendly place set over against the supernatural as darkness against the light. It is perhaps in part due to the series of brilliant discoveries which have revealed a host of actions that have been turned to the benefit of man that we owe this sympathetic leaning of all intelligent people toward the material world, and the acceptance of it in place of the old ideal refuge in a realm of the purely spiritual. In part the change is unquestionably due to the modern understanding as to the relation of man's life to that below his estate. Men have felt the need of a celestial realm less keenly since they have found that they had not fallen from it, but had been lifted from the dust by the forces which inhere in the earth.

A yet more effective influence in bringing about the change of attitude of intellectual people toward the problem of immortality appears to have arisen from an increased interest in their present life. The widening of the sympathies, due to the increase of education, and to the larger understanding of the world's affairs, human and other, has made existence more attractive than it has been at any period within the Christian centuries, if not in all time. Moreover, there has been a gain in the sense of duty by the tasks of life, a growing sense of the seriousness of the business that it brings, which, if I may trust to my experience of thirty-five years as a teacher of young men, is very distinct and as an index of the temper of people, most telling. These conditions make for a devotion to the interests of life in this beautiful world, and against much consideration of those which may come to us after the crisis of death. They make for a sense of unity in our existence whatever be its term.

At first sight it may appear to many persons that the evident decline of interest in the world to come is a falling from the grace which was granted to our fathers, that it is a debasement of those ideals which led men to look past this life of trial and temptation to the serenity of an upper realm. But, on examination, we find that this conception of man's place in Nature—this idea that there are two realms, one of the flesh and the devil and the other of celestial purity—is no part of the doctrine of the great Teacher whom the churchmen profess to follow, but it is the relict of a more ancient belief in the power of evil spirits in the material universe. Science is casting out those devils, giving the world to man in all its beauty and perfect friendliness—we had better say in its kinship to him. With this abolition of the dualistic conception of the universe the opposition of the natural to the supernatural passes away. In its place arises the nobler idea of one realm from which we are not to depart at death, be then our fate what it may. If, as seems by far the most probable, this life of man, so marvellously nurtured through the ages and set forth in each individual, is to be continued onward through the ages even as the kind has continued, we may presume that it will take with it the same blessed burdens of duty and provide opportunities of growth such as we have here. Thus the conception of the rational continuity of life serves to lessen the once intense interest in immortality.

It should not be supposed that the effect of the change in the conception of life which science has brought about has diminished in any way the sense of duty to the present or the future. This motive is doubtless stronger than it has ever been before; stronger, because men are beginning to feel that the universe is their own; that they dwell in their Father's house, and that they remain in it, whatever may befall them at death. To the man of old, the assurance of a happy immortality had the blessed effect that it relieved him of the fear that he might fall a prey to demons. Now that he believes that his danger is from himself alone, the assurance has less value to him. If he is conscious of doing his duty as well as he can, any processes of life hereafter will naturally appear no more interesting than his earthly conditions years hence. So we may judge that the present concern of our people in the moment and its deeds, to the exclusion of the old interest in a life to come, is not undutiful; it means a bettered sense of the conditions and relations of they that are living.

Although it is the purpose of this writing to keep near to the body of fact with which the naturalist has fitly to do, leaving aside the matters of faith and of metaphysics, it is worth while to note some points which, though they are aside from the path we are traversing, are within its field of view. First of these is one set forth in an interesting discussion of the problem of immortality by Prof. William James. In it he fairly meets the old argument that consciousness is but a function of the brain, substantially as contractility is a feature of the muscles by the suggestion that the mechanism of the brain does not directly produce consciousness, but acts merely as a path by which an infinite consciousness finds its way to its expression in the individual life. In his argument he neatly turns the point of the so-called materialists, who, noting that a defect or lesion of a particular part of the brain is attended by the loss of some faculty of the mind, claim that the damaged part produced the faculty. Not so, he says; the part should be considered as the channel of the quality of the mind and not as its source. Expressed otherwise than he states it, the brain might thus be likened to a number of channels which admitted consciousness to the expression which it finds in the body. In this condition the failure of the particular element of the mind on the injury of the part of the brain through which it manifests itself may be accounted for on the supposition that the access of the spirit is blocked.

While this conception of the brain as a means of communication between a universal diffused consciousness and the individual is philosophically interesting and is supported in a way by many interesting analogies, it can not at present be subjected to critical verification, and therefore does not lie within the limits of scientific inquiry. We have, it is true, something like evidence of a pervading intelligence in the natural realm. It is not unreasonable to conjecture that this universal mind may tend to localize itself in individual forms, just as the matter of the universe so wins individualization; but so far as we can see, this view must remain in the field of speculation, for the reason that proof in the sense that the naturalist uses the term can not well be had.

It may also be noted that while religious faith in immortality in the full meaning of the term lies quite beyond the narrow and direct way of scientific inquiry, the phenomenal aspect of such belief, its existence as an element in the nature of man, does come within the scope of the naturalist's observation. There can be no question that faith in the unknown is one of the intellectual characteristics of mankind. It appears in each of the subspecies, and in all with a curious intensity. It has the same organic right to the exercise of its soaring spirit that may be claimed for the trailing motive of science, which is indeed but an offshoot from that more ancient mode of traversing the realm. Observing as we do the evidence that the organic forms move forth in their development toward the possibilities of knowledge in a way which indicates some guidance in their quest, we may fairly ask ourselves whether this explaining motive which is directed toward the spiritual field is not making its way blindly toward the light in much the same manner that our kind broke its path upward through the lower life, or that the eye came to its task of seeing. This hypothesis could be, in a way, supported so far as its general validity is concerned by many phenomena in the organic world, which go to show that parts and capacities relating to work as yet unaccomplished come into existence before they have any substantial use. Thus, to take but one instance out of many: the air- or swim-bladder of the fishes, which appears on examination of the habits of the creature to be not at all related to swimming, and to be in the lower forms of no distinct functional value, is nevertheless the foundation of the lung in the higher vertebrates. Even in our own brains there appears to be a forerunning of function by structure, for that organ in the lower savage is nearly as large as it is in the civilized man, so that a great part of its power is potential, awaiting the call to activity.

This naturalistic view of the religious motive should not be taken as patronizing. The investigator in the realm of Nature is justified in feeling that he holds a commission to inquire wherever he finds matter fit for such work. He, too, is acting as he believes are all his honest brethren in the order of his appointment in carrying out the better motives of the great inheritance. His means for such inquiry are limited to what is disclosed in the sequence of actions. One such sequence he observes in the motive of faith and the work to which it leads. At the same time he discerns that the ways of that faith can not fairly be submitted to the process of verification. Some observers, with the human disposition to contemn other ways than their own, have scouted all faith depending on the evidence of things unseen. This is not the fit course of the naturalist, whose part it is to see what the world really is like; to apply his methods where they are suitable, and to pass by such fields as those of art, poetry, or religion, with a full sense of the limitations of his methods and a confidence that the universe is a large place, of which only a part is for him to conquer.

Some attention has already been called to the state of mind in which men of to-day who have caught the spirit of their time view the question of a life beyond the body. It is clear to all who have attended to the matter that this state is undergoing a rapid change. The key to this alteration is to be found in the conviction that this world is not evil; that it is not parted from whatever else the universe may contain as evil from good; and, further, that man has not been cast down from a higher estate, but has been led up through the ages through inconceivable stages of being to his noble station of understanding. This, and all else which we have won, has brought about a marvellous reconciliation with the world of the creature so long parted from it. In large measure man's ancient fear has gone with the ancient ignorance which aroused it. There is no longer the apparent need of a refuge in a realm of another kind from that in which he is born, where he might be safe from Satan in the protection of the Lord. Happily, those centuries of torment are with the past. Men may now as Christians look upon existence even more cheerfully than the pagan Greeks in their best days; with a deeper joy, for they see further into the deeps.

Looking forward on the path on which men are so rapidly advancing, we can discern in some part the state to which he is to attain when his reconciliation with the Nature about him is more completely effected. We can see that the meaning of man's organic history is to be borne in upon him with such effect as to give him a perspective undreamed of by the ancients. He is to see himself as far more truly divine in origin than the old ideas of his creation led him to believe. He will see that his life is, by way of the generations, inconceivably enduring; that his individuality, in one sense but a momentary manifestation of the life of the kind, is absolute and inseparable, unique even in a universe of individualities.

To these conceptions of the historic place of man and the relation of his selfhood to the stream of life in which it appears, there is possibly, in time, to be added evidence going to show that his intelligence in a personal form endures after the critical point of death. By these three considerations, particularly on the two first mentioned, for they most distinctly relate to dutiful action, we may reasonably conjecture that his behaviour with reference to death will be mainly shaped. As we see by the effect of the relatively limited appreciation which people have gained as to the order of Nature, the extension of this knowledge is likely to bring about an affectionate relation between man and his surroundings. Seeing that the ancient task of elevating the kind which was long committed to external powers has now, by the gift of reason, come into his hands, we may well believe that he will find in toil for this end a pleasure unknown before. To the old noble motives of charity will be added a higher intellectual pleasure, such as may be had in advancing a great work.

The faith in the actual world about them which is now opening to men is no new kind of confidence; it is but an extension of the old faith over the fields which science has won. It in no wise denies the trust in heaven; it only denies that the earth is another and separate realm. When men come to know this truth in its fulness we may expect an intensity of devotion to the cause of betterment which was impossible under the old conviction that the world was very evil, and that the only cure for it was its destruction. With this motive of rational help in mending ills will go a new conviction as to the relation of one creature to another. The ancient conception of this relation as through the common bond with the infinite was, with most men, too remote and unsubstantial to affect conduct. The new view of the nature of the union, that it is a vital connection re-enforced by a sense of the beauty of all organisms, has already, as we see in the advance which this century has made as regards cruelty to animals, gone far toward lifting the conception of the matter to a high plane. In time we may look to it for a far-reaching reconstruction of the attitude of men to their fellow-sharers in the blessings of life.

In these conditions of the future, which are now in their beginnings with us, we may expect that men living to their utmost with the cares which their understanding of their place in life has imposed upon them, giving their lives in the happy exchange of services, will live on with no fear of the hereafter. Seeing a real though impersonal immortality in the past of their life as it has come up through the ages, they will look forward with a perfect confidence to the future which awaits them, sure in their belief, with a certainty denied to their fathers, that the Power that has brought them here will deal well with them in the hereafter.

To those who may protest that this view leaves out of account all the vast mass of suffering the world contains, that this suffering cries to Heaven, the student of the situation can answer that in so far as life is not beautiful, that it does not bring happiness, it is for man to mend. To him, because of his intelligence, belong powers of creative activity which can overcome the evils which mar the nobility of his existence. In contending against them he may find what remains to be found to take him away from the fear of death. It is in going forth to the fellow-man that the last of this pain may be stilled, for the man who dwells completely with his fellow-man leaves this life without passing through the dark portals.

The progress in the development of the individual in the inorganic series is relatively slow and the measure of the differentiation attained but slight. We reasonably postulate essential indifference among the atoms of the same element: the variety there may be limited to that presented by the several species of matter. In the molecules it is probable that there is nearly if not quite the same uniformity of constitution, except it may be in those of the more complicated order, where we may fairly conjecture that some slight variations occur. In the protoplasmic unit, if such exists, there may be considerable individuality, for in that phase of matter the external world begins to bear in on the organization, inducing variety in its features. As a whole, however, the realm of the atomic societies appears, so far as we can penetrate into the microscopic depths of Nature, to be near the foundations of the process of individualization. Yet, from what we know of the visible world, we are almost forced to imagine that the atoms in turn are compounded in stage below stage into the depths of the infinitely small.

The larger aggregates of molecules in the massive substances and crystals have a far more distinct individuality than we are compelled to postulate as occurring among the molecules. Thus, among the crystals, we find that each has its own shape, so differing from the others of its kind that no two are exactly alike. It is evident that in this plane of organization the structure feels the influence of environment and marks the results of the action of the external in its abundant individual variations, each indicating a reaction between the internal motives and those which come from without.

In the largest individuals of the universe, the celestial spheres, excluding in the consideration the organic life they may bear, the individualizing processes at work in the inorganic realm attain the summit of their action. So far as we can judge from the few of these bodies we know about, each has its peculiar stamp, each acts and reacts on its surroundings in a measure different from all others. Thus, in the case of our earth and its moon, we have two bodies differing the one from the other in very many features. The one is a mere mass of matter in a sense inert, and the other quick with a host of varied impulses. So, too, the sun and Mars, the bodies next in the order of knowledge, are each separated in quality from all others we know. It is likely that a complete account of the hundred or so million suns, and perhaps the thousand million planets within the range of vision, would show us no repetitions, but ordered individualities, each stamped with the mark of its varied relations to environment. It should be noted that these variations are not really stamped in the sense that they are due to one impression. They are the product of continued action and reaction, such as makes each particle of matter in the universe dependent on every other throughout all time and space. Thus, our earth each day receives a vast tide of energy from the sun which it appropriates to activities, ranging from the currents of the sea to those of our own veins, while every atom feels the pull of every other in the realm and marks the result in its doings. No one can conceive these activities of a celestial sphere without feeling, with the great Kepler, that they are really living bodies, as he deemed the earth to be. They have indeed an organized life, lacking only the singular complications to which the organic body attains, which affords a capacity to store experience and to transmit it to successors.

Out of this great world of physical individualities which knows no other bond than that which unites the units of each kind in a simple classification, all alike within their several species, there comes no advance. Such as they are, save for minor variations impressed upon them by their environment, they are throughout the universe. There is in them no evident sense in which each unit forms a part leading toward ultimate remote purpose. The individuals, except perhaps the atoms, come into existence and pass away; but these comings and goings are not organized in any evident order; there is no true birth or death. There is no perception of the environment; when it affects these structures it does so directly in a mechanical way. There is no record of the action save in the form it brings about. The tendency of each of these low-grade individuals of the inorganic world is to attain their fit shape and to remain therein unchangeably. They are, in a word, static equilibriums. Their state marks the perfect equipoise of all the forces which enter into their making. What to the higher organic individuals is death, is their perfection.

Somewhere in the advancing complexity of the inorganic, doubtless in the compounds made possible by the properties of water, there came upon the hitherto lifeless earth a living form. It would be futile to conjecture the shape of this creature or even its chemical composition. The only point of which we may be sure is that it was in the larger meaning of the word sentient; that it in some way and in some measure took account of its environment by means of impressions of the environment on the organism. It is a fair supposition that this primal organic body had a more definite mode of appropriating materials for its services than any of the inorganic forms; that it was more distinctly endowed with a capacity for multiplying itself than any of them have. It is also probable that it was a definitely limited form and not a diffused sheet of living matter on the floor of the waters in which it originated, such as the so-called *Bathybius* was at one time supposed to be. But the essential point was that this new aggregate of matter had passed a critical point, like that which is passed when solid water enters the fluid state, a new realm was opened to the sentient and therefore educable, ever-expanding being.

From the beginning of the organic individual to man we have the history of the new type of individuality—the type that progressively, more and more, is fitted to appropriate knowledge from the outer world, to win profit therefrom, and to transmit that profit to the successors of their bodies. These harvesting and storing individuals continue to gain in station, but all the while doing their work unconsciously with no sense of what it means; doing it through the life of innumerable species, until finally the plane of man is attained. Then there comes another critical point, of the first order, so to speak, one equal in importance to that which led from the non-sentient to the sentient. This crisis came with the development of self-consciousness and with it the moral estate. The rest of the story—it is that of a day against the ages of lower life—shows us the progressive enlargement of knowledge and of the sense of duty which comes therewith. So far as we can see, this enlargement, as yet perhaps hardly begun, will close the account of life on this sphere.

Looking back over the series of events which have led to the development of man, the most striking feature in the history is the progressive aggrandizement of the individuals which form the long stairway. At each step upward we find the creatures receiving more of the store which the ancestry has harvested from the environment. Even where it is least, this body of winnings from experience in action defies the imagination which seeks to measure it; but when we come to man it is magnified many thousandfold. Yet this store is not a mere common stock of impressions, a like gift for each of the units of the series; it is, on the contrary, so dealt out to them that each has a portion distinct from every other. In a word, these inheritances are profoundly interactive among themselves, in such a manner that it is almost inconceivable that a like store becomes the property of any two individuals.

It is at once so important and so difficult to appreciate the full meaning of organic individuality that it is well to consider some of the familiar facts of the matter as they are exhibited among men. It is a common observation that while all human beings resemble one another in a general way and some are nearly alike, there has never been a case when two of the greatest similarity were brought into a close comparison where the individuality of bodily features was not at once apparent. It is probable that of all the men who have ever lived no two were ever so identical in form that a tolerably skilful observer would not be able to distinguish them. Yet these features of the exterior are but a minute part of the aggregate that makes up a human being. When we consider the intimate structure, especially that of the brain, we see that it would indeed be miraculous if there were not a very great number of peculiarities characteristic of each of the human units. From what we can judge of the comparative mental states, it seems most probable that the differences in the mental qualities of men are far greater than those of their bodies, so that if we could expose these hidden features to view we would have, in place of our specifically similar comrades, a wonderful—indeed, we may say almost horrible—diversity before our eyes; a diversity exceeding all that is presented to us by the wide range of bodily form which the whole vertebrate series presents. Something of this we recognise in the minds of those people we have known well; more of it we can appreciate when we think of the difference in capacities of particular kinds, such as those for music or mathematics, where the capacities may range from nearly nothing to the highest point in the scale which we can conceive.

There is reason to believe that the inheritances which shape the body and the mind alike are profoundly interactive in the germinal stage during which the individual is in process of construction. In all the higher life two beings join in giving their dissimilar stores of inherited experience to the nascent unit. Before birth, and in less measure after birth, these diverse stores of transmitted influences interact. We can not imagine the range or scope of the interaction, but we are sure that it is between innumerable hosts, and that the adjustment can not in any two cases be exactly the same; at least the chance is practically as one to infinity against a resulting identity either in body or mind. It is, as I here find, quite impossible to convey to the reader an adequate sense of the conditions of inheritance, which make for individuality even in the simpler organic forms; but these operate with vastly greater effect as the complication of the transmitted influences is increased as we find them in man.

As soon as the new life is established in the egg, even before it sees the light, it begins to be affected by the environment which sends in its multigenerous impressions. Each of these reacts on and qualifies the ancestral store of capacities until, at the adult stage, every part of the old store has been more or less readjusted by the new experiences. This last process completes the individualization of the creature, leaving him distinct and separate in the world—a being the like of which has never before been and will never again appear. To finish the individualizing process in man there comes the self-consciousness, and with it the moral sense which causes the creature to feel, though happily not in its full truth, the degree in which he is parted from his kindred and from the universe.

It is hardly possible adequately to state the isolation of the individual man. Notwithstanding all his endeavours through friendly association to win a sense of identity with his fellow and with Nature, he is doomed to remain apart and in large measure alone. He has to live and to bear as best he may the tragedy of his individuality. His only way to relief is by the sacrifice of his self to his fellows; in casting so far as he can his personality into the stream of life where it may in a measure be merged in the common larger being. Yet for all the relief this precious resource may give, this sovereign individual has to remain isolated, waiting what may be for him in the future of the series of actions which have lifted him from the dust to this great estate. With this sense of isolation goes that of the apparent temporariness of the individuality. This quality has only been fully appreciated since we have come to an adequate conception or rather postulation of the duration of the past, for the truth is beyond all understanding. Against these ages the life of the person is scarcely more than that of a wave of light in the path the impulse follows on its way from the sun to the earth. As a matter of proportion it is a mere nothing, or at least of no more than atomic value.

At first sight these features of isolation and of brevity make a very powerful impression on the beholder, one which is the gravest note in all lyric thought and poetry. The cry of "What is man?" from the Hebrew singer has been re-echoed in all ages and lands wherever men have attained to the dignity of contemplation. Our better knowledge, while it manifolds our sense of the separateness of the individual life and of its brief duration, has gone past those distressing features to show us, in part, what they mean. It sets forth the person as a unique storehouse of experience; as a garner of the times that have been; as the embodied history of the past. In a word, it gives a value to the organic individual of all grades which exists in nothing else we know in the realms about us.

While something of the singular value of the individual pertains to all the units of organic life, it is essentially peculiar to that of man; for in him we have not only the vast store of experience, but the newly added feature of self-consciousness and all that goes therewith. This addition to the ancient qualities of the animal places our kind in a distinct sphere, separated from that which is lower by an interval effectively as great as that which parts the group of organic units from those of the inorganic realm. It may be, as some have supposed, that self-consciousness and the moral sense have their beginnings in the higher brutes. They most likely have in the dog, a creature which has, in a way, been forced to acquire something of human nature. Even if this be the case, the value of the crises which induced the perception of the selfhood we find in man remains. Its importance is not changed, even if it prove less sharply separated from the lower life than it appears at first to be.

The great significance of the individual man fairly raises the presumption that his place in Nature has a meaning that is not to be measured by the length of his life in the body. Looking as we must do for a purpose that justifies to our understanding all this doing of Nature, is it not reasonable to suppose that one at least of the designed results is attained in the creation of these historic personalities? May we not fairly regard these persons as containing and preserving the permanent gain which comes from the work of the visible universe: as the indestructible profit of a work which otherwise would offend us by its apparent resultlessness? I am aware that these conjectures are open to the objection that they seek to explain Nature by man, but there is no other way to this explanation save by the human understandings won from ages of selected experience with this world whence it came. It is not, as was of old imagined, a stranger in a strange land who makes such judgments, but a very native, with the right to an opinion on what is in fact a part of himself.

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